THE

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OF

THE ASIATIC SOCIETY

OF

BENGAL.

VOL. IV.

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THE

JOURNAL

OF

THE ASIATIC SOCIETY

OF

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VOL. IV.

JANUARY TO DECEMBER,

1835.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asitic Society at Calcutta; it will languish, if such communications shall be long intermitted; and will die away, if they shall entirely cease."

SIR WM. JONES.

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1835.

PREFACE.

THE Journal has now survived its fourth year of existence, or including the *Gleanings in Science*, its seventh; yet so far from feeling its vigour abated, or finding its contributors grown languid, or its supporters falling off, the past year has produced a volume overflowing with original matter, even to the exclusion of extracts from the publications of Europe—a volume exceeding by fifty pages of text any that has preceded it, and embracing nearly double the usual number of plates.

The List of Subscribers in India remains in numbers much the same as before; but the demand for the work in England increases daily, and much of the new matter it contains is greedily transferred to the pages of European literary and scientific periodicals of wide and established circulation. The Editor says thus much by way of information to his numerous correspondents throughout India, who have not the opportunity of perusing the home journals, and who lose sight of their own labours the moment they have entrusted them to his pages.

The pecuniary aspect of the concern, up to the end of 1835, would not appear very encouraging to a *speculator*, but it is satisfactory as far as regards the object of maintaining a recipient for literary and scientific researches in India, at the smallest tax upon its supporters, and yet without any ostentation of personal sacrifice. The collections up to the present day have been

in all ..... Sicca Rupees,	16996	11	8
There remain due by Subscribers in Bengal,	1815	5	0
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				3652	3	11
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Making the total expenditure, Rupees, ...				21385	2	2

And leaving upon the whole transaction a balance against the Editor of Rupees 516 11 4 exclusive of the portion of outstandings, which (with regret be it said) must be written off as irrecoverable.

Although the price of the work is already lower in proportion than that of any similar journal in England, France, or India, the EDITOR has felt it incumbent upon him to volunteer a further small reduction, for the sake of simplifying accounts and uniting with the Asiatic Society in the adoption of the new currency. Subscribers all over India will henceforth have to pay one Rupee per number, without any regard to the fractional excess of the late Calcutta sicca.

The loss to the Editor by this resolution would have been six and a quarter per cent., had it not been most considerately met by a corresponding reduction, from the old to the new rupee, in the charges for printing by the Proprietors of the Baptist Mission Press, to whom he thus begs to offer his public and sincere acknowledgments.

The calculated amount of postage paid by up-country Subscribers to the Government has been, in the past year, Sicca Rupees 1200, without including the profits from an extensive correspondence due entirely to the existence of the Journal. The labours of the Post Office Committee are not yet completed; it would therefore be premature to hold out any promise of more favorable rates to such subscribers as have been induced to withdraw on account of the dâk charge exceeding the price (and it may be presumed in their eyes, the value) of the work

Some modification of the existing scale of postage may however confidently be expected, which may save contributors especially from the heavy tax on the transmission of manuscripts*.

If it be asked, what has been the most prominent object of interest discussed in the present volume, the answer must naturally point to the Proceedings of the Asiatic Society, in regard to the publication of the Oriental Works which had been suspended by an order of the Supreme Government, dated the 7th March, 1835.

Without venturing to impugn in any degree the wisdom or policy of a measure which has in the face of all India withdrawn the countenance of Government from the learned natives of the country, and pronounced a verdict of condemnation and abandonment on its literature, it may be allowable in this place to propheey, that the conduct of the Asiatic Society, in stepping forward to rescue the half-printed volumes of Sanscrit, Arabic, and Persian, will be approved and applauded by every learned Society and every scholar in Europe. Left in their unfinished state, they would have indeed merited the opprobrious designation of an "accumulation of waste paper," applied to them by the Government which had originally ordered, and had expended vast sums upon, their publication.

There seems something so anomalous in this sudden change of state resolve, that it can be explained (excused would be too presumptuous a term) only by the peculiar constitution of the British Indian Government, in which the interests of a literature, and of languages, necessarily foreign to the deputed ruler of these distant provinces of the British Empire, must be left to the fluctuating opinions and influence of his local advisers. The unbiassed spectator beholds, at one period, the Government accusing itself of doing nothing for Indian learning and making amends by establishing colleges and patronizing publications and translations into the Oriental languages: anon, he beholds it throwing up all the works half printed; and withdrawing all the scholarships and exhibitions, which had been instituted for the encouragement and support of poor native students;—annulling most of the appointments which

* In one case, *Twenty-two* Rupees on a brief article from Bombay.

heretofore were held out as temptations to the study of the classical languages by Europeans—and leaving the completion of the *Mahábhárat* to the charity of private subscription, along with the statistical information collected by BUCHANAN; the geographical and geological, by MOORCROFT, VOYSEY, and HERBERT! When he sees all this, and a contribution of 1200 rupees refused for the printing of a Cochin Chinese Dictionary, tendered by a Catholic Bishop, in the distressed state of his Mission, even without demanding any remuneration for the labour of compilation, can he divest himself of the idea that the presence or the absence of a Sir WM. JONES, a WILKINS, a COLEBROOKE and a WILSON have influenced these opposite resolutions? The learned world will at any rate rejoice that our Hindustáni, Bengáli, Marhatti, Tibetan, and Sanscrit Dictionaries have passed into permanent existence anterior to the epoch of interdiction; and that while the Asiatic Society supplies, however feebly, the patronage lost elsewhere, India need not be wholly dependent upon France and Germany for its editions of the Sanscrit classics, and for the development of the ancient history and philology of the nations under British rule.

This is the gloomy side of the annual picture; but let it not be imagined, that there is no sunshine; nor that we seek to shade it.

The government has liberally rewarded and patronized the labours of Mr. MASSON, and of MOHAN LA'L,—it has deputed a scientific mission under charge of Dr. WALLICH, into the tea districts of Assam; it has in like manner deputed Mr. ADAM, to follow the steps of Dr. BUCHANAN, in collecting statistical information principally in connection with the education of the people; it has employed its engineer officers in a grand sectional survey of a line from Rájmahal to Cutwa, with the view to examine its fitness for a canal to join the Huglí and Ganges: and it still supports on a magnificent scale the grand Trigonometrical Survey of India. The journal has not indeed been favoured with any report of the progress of these great works, but it is known that the canal survey is now finished:—and that Major Everest has completed the measurement of a second base near Seharanpur. Other official reports, such as surveys of Socotra, of the Maldives, Mr. Gordon's excursions in China

and the discovery of inscriptions in Arabia, have been obligingly communicated by the Bengal and Bombay Governments.

The train of individual discoveries, physical and antiquarian, has progressed without intermission : most interesting inscriptions and coins have been brought to light, and illustrated.

Fossil animals, of new and extraordinary species, have followed the discovery of Cuvierian genera, themselves but recently made known, in the Sivâlik range : the history of the Malayan states, accounts of various sects, of ancient ruins, of Buddhist cosmogony, and of Tibetan works, are among the subjects of the present volume ; and it is but fair to state, that materials for a new volume of the Quarto Researches have been collecting, and printing, at the same time with the contents of the Society's Journal.

Contributions in Meteorology this year have seemingly been wanting : they have however been received regularly from various quarters, and, now that the year is completed, will be made use of in a condensed form.

Criticism of Scientific Works published in India has indeed been neglected, and that during a period when the press has been unusually prolific. This department of labour, as far as regards the bringing to public notice new works, has been amply fulfilled by the daily press ; and beyond this it would be hardly safe to extend the province of criticism in this country, where the Editor cannot conceal his own fallibility under the disguise of an anonymous review.

Want of space and want of leisure must, in the last place, be pleaded as an excuse for the absence of retrospective analyses of the progress of the Sciences in Europe. The Editor hopes to obtain the aid of friends whose attention will be particularly engaged in pursuing these branches of knowledge in the ensuing year ; but all official functionaries in India are so fully occupied, that it is hard to expect from them work of supererogation. It is some consolation, that the Indian reader being himself somewhat in the same predicament, will not have time to discover the blemishes and blanks of our amateur periodical.

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ERRATA.

Page 102, line 7, *for* ' (720 dollars),' *read* ' (720=1 dollar).'
112, 24, *for* ' 12½' *read* ' 6 feet.'
124, 14, *for* ' ङ्ग,' *read* ' ङ्ग,' *for* ' ङ्क,' *read* ' ङ्क,' *for* ' ष,' *read* ' ष,' *and for* ' नात्य,' *read* ' नान्य.'
— 15, *for* ' वाणाब्धि,' *read* ' बाणाब्धि,' *banabdhi.*
173, line 26, dele ' American.'
174, 2, *for* ' Oζvs.' *read* ' Oξvs.'
— 10, *for* ' periferiæ,' *read* ' periphæriæ.'
176, 29, *for* ' lacertæ,' *read* ' Incertæ.'
215, 14, *for* ' Thecleobranche,' *read* ' Nuclèobranches.'
— 30, *for* ' by a line,' *read* ' hyaline.'
222, 23, *for* ' statistics,' *read* ' statics.'
223, 20, *for* ' $\frac{1}{3}$' *read* ' $\frac{1}{5}$.'

ft.	no.	ft.	no.

224, 5, *read* $5 \times 16 + 9{\cdot}8602 \times 2 = 99{\cdot}7204$.
226, 10, *for* ' $\frac{2}{24}$' *read* ' $\frac{8}{24}$.'
— 19, *for* ' decreased,' *read* ' encreased.'
227, in the table, in column 22 feet length of bearing, *for* ' 13·14' *read* ' 13·9.'
for ' 12·10' *read* ' 12·9.'
for ' 12· 8' *read* ' 12·1.'
— line 12 from the bottom, *for* ' depth,' *read* ' diameter.'
228, line 26, *for* ' if beams,' *read* ' of beams.'
267 25, *for* ' d'appine,' *read* ' d'appui'
270, 6, *for* ' of,' *read* ' by the current.'
271, 30, *for* ' in consonance,' *read* ' inconsonant.'
276, 4, *for* ' irregular,' *read* ' is pretty regular.'
362, 14, *for* ' Wurrum,' *read* ' Nurrum coss,' (*narm kos.*)
— 7, *for* from bottom, *for* ' Binining,' *read* ' Binàg mandir,' (temple of Ganes.)
363, 14, *for* ' at Midug' *read* ' at mid-day.'
— 16, and 17, *for* ' been seen from thence and Bandra, two villages or towns in the said territory,' *read* ' been seen from Thinie and Bandra, two villages or towns in the Ját territory.'
364, 16, *for* ' jogies,' *read* ' jognies.'
365, 9, *for* ' Delhi town pillar,' *read* ' Delhi iron pillar.'
366, 43, *for* ' Pl. xxix.' *read* ' Pl. xxx.'
369, last line, *for* ' vol. i. pp. 82, 86,' *read* ' vol. ii. pp. 82, 86.'
370, 1st line of inscription, *for* ' सुराचितं' *read* ' सुराचितं.'
379, line 26, *for* ' quantity,' *read* ' quality.'
399, 22, *for* ' 150 miles S. W.' *read* ' 100 miles South.'

" In the second volume of the JOURNAL, page 79, the name of Ellora is written Ellore, in giving the site of trap rocks penetrated by tubular calcedonies. As the rocks at Ellore are of a very different formation, it is desirable that this error should be corrected. Ellore is near Golconda."

Page 400, line 37, 38, *for* 'Maha Yazawen wen dan gyee,' *read* 'Maha Yazawen dau-gyee.'
— 40, 41, *for* 'Thore Khettara,' *read* 'Thare Khettara.'
401, 31, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 33, *for* 'at the foot of,' *read* 'at the ford of the.'
402, 3, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 6, *for* 'Tsalen wot thaken young,' *read* 'Tsalen wot thakan zoung.'
— 7, *for* 'Kan shye young,' *read* 'Kan shye zoung.'
— 9, *for* 'Than bethen,' *read* 'Than bathen.'
— 10, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 14, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 15, *for* 'Tsalen wot thaken,' *read* 'Tsalen wot thakan.'
— 18, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 21, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 30, *for* 'Yonatha,' *read* 'Yowatha.'
403, 26, 27, *for* 'Nga young gyan,' *read* 'Nga zoung gyan.'
— 28, *for* 'Male mountain,' *read* 'Malée Mountain.'
404, 1, and 2, *for* 'Taroup maur,' *read* 'Taroup mau,' and in the note *for* 'Symess Taroup mion' *read* 'Symes's Tirroup mion.'
— 28, 29 *for* 'Toungug:' *read* 'Toungngu.'
— 30, before 'called,' *dele* 'is.'
— 36, *for* 'Wasted,' *read* 'washed.'
— 37, *for* 'Langa manda,' *read* 'Lauga nanda,' and *for* 'Anauratha zan,' *read* 'Anarautha zau.'
413, last line, *for* 'N. S.' *read* 'N. E.'
429, 5, *for* 'Colophonite,' *read* 'Colophonitic rock is.'
432, 25, *for* 'erratic,' *read* 'euritic.'
505, 22, *for* 'Eclipse,' *read* 'Bessy Bedlam.'

Errata in the 3rd Volume.

Page 178, line 24, *for* 'Fokien, Kyanti, and Kyang-nau,' *read* 'Fokien, Kyan-si, and Kyang-nan.'
— 26, *for* 'Lu-ngau-cha, *read* 'Lu-ngan-cha.'
— 27, *for* 'Paelcha,' *read* 'Pacul-cha.'
179, 10, *for* '62°5′,' *read* '62°.5.'
180, 3, *for* 'Kyang-nau,' *read* 'Kyang-nan.'
— 31, *for* '54°5′ Farh. *read* '54°.5 Farh.'
181, 14, *for* '60°9′,' *read* '6° to 9°.'
182, 4, from bottom, *for* '1,200 or 1,400 feet,' *read* '2000 feet.'
183, Erase the section.
184, 8, from the bottom, *for* '29° 30′,' *read* '29° to 30°.'
185, 8, *for* '29°30′,' *read* '29° to 30°.'
— reference at the bottom of the page, *for* 'Transactions,' &c. *read* 'Asiatic Researches,' Vol. XVI.
186, 20, *for* '29°30′,' *read* '29° to 30°.'
— 25, *for* '12 to 1,400,' *read* '2000 feet.'
— 28, *for* 'mean,' *read* 'main.'

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JOURNAL

OF

THE ASIATIC SOCIETY.

No. 37.—January, 1835.

I.—*Analysis of a Tibetan Medical Work.* *By* M. Alexander Csoma de Körös.

The principal work on medicine in Tibet, is that entitled the "r*Gyud* b*Zhi*" (རྒྱུད་བཞི the tract in four parts). It is attributed to Sha'kya, though not introduced into the *Kah-gyur* or *Stan-gyur* collections.

When in Tibet I requested the Lama, my instructor in the language of the country, to give me an account of its contents, which he did in an abridged compilation divided, like the original, into four parts. The present translation of the Lama's manuscript may be interesting to those who are curious on the subject of Tibetan literature, and the state of medical practice in that remote part of the world. The materials of the original are as usual all derived from Sanskrit works, which have not however hitherto been made known in an English dress.

The following is the account given in the work itself of the manner in which this Treatise of Medicine found its way to Tibet.

In the time of Khri-srong Dehutsán (in the 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated it in Cashmír, with the assistance of a physician-pandit (རྒྱ་བོ་མཁའ་དབྱིངས་-Davá *m*Ñon-gah) presented it to the above mentioned Tibetan king. At that time it was received by "*gyu-thog*" a learned physician, and by several others, and afterwards it devolved successively to others till *gyu-thog*, (the 13th in descent, from the first) styled the New *gyuthog*, to distinguish him from the former physician of the same name, who is called 'the ancient.' This physician much improved and propagated it; and at that time, it is stated, nine men became learned in medicine.

The Lama, who wrote me this extract, enumerated several works on medicine, current in Tibet, of which the most celebrated is a

commentary on the present work, entitled " Baidúrya sñon-po" (the lapis lazuli) written by " Sangs-rgyas rgya mts'ho" སངས་རྒྱས་རྒྱ་མཚོ a regent at Lassa about the end of the 17th century.

The LAMA states that there are about forty books or works written in Tibet, on medicine, besides the five volumes in the Stan-gyur collection, and the scattered occasional instructions on medicaments in the Kah-gyur.

The chief medical school in Tibet is at Chák-phuri (ལྕགས་ཕུག་རི) a monastery at or near Lassa. There are also two others, in middle Tibet, of some repute, called Cháng-Zúr (བྱང་ཟུར).

FIRST PART.

This is entitled རྩ་བའི་རྒྱུད, rtsa-vahi-rgyut the root or basis of the (medical) tract. It is divided into six chapters.

First Chapter.

In this is described how CHOMDANDAS (SHAKYA) transforming himself into the shape of a chief physician, in a forest of medical plants, delivered his instructions, in a superb palace, in the presence of gods, sages (or *Rishis*), and a large train both of heretic and orthodox hearers.

Second Chapter.

He (SHAKYA) addressed his audience thus:—" Assembled friends! be it known to you, that every human creature who wishes to remain in health; and every man who desires to cure any disease, and to prolong life, must be instructed in the doctrine of medicine. Likewise, he that wishes for moral virtue, wealth, or happiness, and desires to be delivered from the miseries of sickness; as also, he that wishes to be honoured or respected by others, must be instructed in the art of healing." Then one of the hermits or Rishis (དྲང་སྲོང་-Drang-Srong) expressing his desire of promoting the well-being of others, requested his advice as to the manner in which he might become instructed in the doctrine of medicine. Then the teacher (SHAKYA) said: (or commanded)" He must be instructed in the four parts of the medical science, which are the

རྩ་བའི་རྒྱུད་—; བཤད་པའི་—; མཉམ་བཅད་ཀྱི་—; and སྒྲུབ་པའི་རྒྱུད root or theory, explication, instruction, and lastly manual operation; farther, he must be instructed in the eight branches of healing; viz. 1, the curing of the whole body; 2, of particular diseases, incident to children; 3, to women; 4, the curing of diseases caused by evil spirits; 5, of wounds made by a knife, spear, &c.; 6, of all sorts of venomous or poisonous infections; 7, of the infirmities of old age; and 8, the increasing of virility in men. These are the principal divisions of the whole medical treatise.

The number of chapters in the four parts of this medical tract, amount to 156.

In the explanatory part, there are 11 places or sections, and 31 chapters; in the instructive part on cures or remedies for each specified disease, there are 15 circumstances and 92 chapters;—the last part has four divisions and 27 chapters.

Third Chapter.

The theory of the human constitution is illustrated by a similitude taken from the Indian fig-tree (ཨཱ་ཤྭ་ཏྠ་ཨཱདི). Thus, there are three roots or trunks; thence arise nine stems; thence spread 47 boughs or branches; thence 224 leaves; two blossoms, and three fruits. The explication of the simile as applied to the states of the body. The single root or basis of diseases; the stems, branches, and leaves arising thence, taken or considered in a healthy and in a diseased state. Distinctions with respect to wind; ditto, with respect to bile; as also to phlegm; their respective offices, operations or influences.

There are seven supports of the body on which life depends; the chyle, blood, flesh, fat, bone, marrow, and semen. Description of the three sorts of excretions or sordes of the body; ordure, urine, and sweat.

The three generative causes of disease are: lust or ardent desire; passion or anger; dulness or ignorance. By the first is caused wind; by the 2nd, bile; by the last, phlegm. The accessory causes of disease are four: 1, season with respect to cold and heat; 2, any evil spirit; 3, wrong use of food; and 4, ill conduct of life.

The parts of the body, commonly subject to diseases, are six: the skin, the flesh, the veins, the bones, the viscera, and the bowels.

The proper places of the three humours are: that of the phlegm in the upper part of the body, as the proper place of dulness, in the brain or skull; that of the bile, in the middle part of the body, which is appropriate to anger; and the wind resides in the lower part of the trunk, in the waist and loins, as in its proper place.

There are 15 ways or channels through which disease spreads itself. The channels of the motion of wind are, the bones, the ear, skin, heart, artery, and the guts. The blood, sweat, the eye, the liver, the bowels, are the ways or vehicles of bile. The chyle, flesh and fat, marrow and semen, ordure and urine, the nose and the tongue, the lungs, the spleen, and the kidneys, the stomach, and the bladder, are the vehicles for the conveyance of the phlegmatic humour.

With respect to the three humours, this farther distinction is made: wind is predominant in the diseases of old people; bile, in those of adolescents or youths; and phlegm, in children.

With respect to place (or part of the body); wind occurs in the cold parts of the body; bile in the dry and hot parts; phlegm abides in the moist and unctuous parts.

The several seasons, in which the diseases caused by any of these three humours prevail, are thus stated: diseases, caused by wind, arise commonly during the summer season, before the dawn, and about mid-day. Those caused by bile, in autumn, about mid-day and mid-night. Phlegm prevails during the spring season, and in the morning and evening.

There are specified nine sorts of diseases, in which there is no hope of recovery.

On the 12 causes by which any of the diseases caused by any of the three humours, is changed into another, as wind into bile and phlegm, &c.

All diseases are classed under two heads: heat and cold. Those, in which wind and phlegm prevail, being of natural water, belong to cold. Blood and bile, being of natural fire, belong to heat. The diseases caused by the worms and the serum, belong both to cold and heat.

Fourth Chapter. On the symptoms of diseases. On examining the tongue and urine. On feeling the pulse. On asking (orally) after the circumstances, how the disease first arose, and its progress,—what pain is felt, what sort of food has been useful or noxious?

Especially with respect to the tongue: If the tongue is red, dry, and rough, it is the sign of prevailing wind; if covered with a yellowish white thick substance, it is the sign of bile; if covered with a dim, white, soft, and moist substance, it is the sign of phlegm.

With respect to the urine: If the urine of the patient is blue, clear like spring-water, and has much spume or froth, it is the symptom of wind; if yellowish red and thick, steaming or vapouring greatly, and diffusing a smell, it is the sign of bile; if white, with little smell, and steam or vapour, it is the sign of phlegm.

With respect to the pulse: When the physician feels the pulse, if beating greatly upwards it somewhat stops, (if irregular) it is the sign of wind; a quick full beating is the sign of bile; a sunk, low, and soft beating is the sign of phlegm.

The physician's 29 questions to the patient about his food, exercise, and the pains or relief felt after having taken such and such a food, made such and such an exertion, &c. are here detailed.

Fifth Chapter. On the means of curing diseases.

1. With respect to food:

The several sorts of flesh, grain, vegetables, and liquids employed successfully in curing diseases caused by wind. Specification of the several sorts of animal and vegetable food, and of soup and liquids or potions, by which bile is cured. Ditto of those that are good against phlegmatical diseases.

2. With respect to one's conduct of life or exercise.

It is good against wind to remain in warmth, and to have a companion with whom one can best agree. Against bile: to remain in a cool and still place, or undisturbed. Against phlegm: to cease from exertion or business, and to remain in warmth.

3. With respect to medicaments to be used against these three humours.

Those against wind are of three different tastes: sweet, sour, and saline; and with respect to their efficacy, unctuous, heavy, and soft.

Those used against bile are, sweet, bitter, and nauseous bitter:—their efficacy; coolness, thinness, and dulness, or bluntness.

Those used against phlegm are, hot, sour, and acrid:—their efficacy: sharpness, roughness, and lightness.

Mixtures of medicaments with respect to their tastes; for assuaging pains, and for carrying off diseases, or for purging.

1. Assuaging medicaments:

Against windy diseases: soup, and medical butter (a kind of sirup).

Against bile: liquid medicine and powder.

Against phlegm: pills and powdered medicine (aromatics?)

The several kinds of soup are: of bones, flesh, butter, molasses; of wine, &c.

There are specified five kinds of sirup, according to the different principal ingredients, their several applications and effects.

2. Depuratory or purging medicaments.

In windy diseases: a gentle depuratory medicament.

In bilious diseases: a purging physic.

In phlegmatic diseases: emetics.

With respect to the first there are specified three sorts of depuratory medicaments, the purging medicaments are of four kinds, the emetics are of two sorts.

With respect to physical (or chirurgical) operation, against wind: the smearing of the body with butter, &c. and cauterising in the Hor (or Turkish) manner. Against bile: phlebotomy, and cold water (or bathing in ditto). Against phlegm: warm applications, and cauterising.

Specifications of the several kinds of cures against wind, bile, and phlegm. They amount to 98 (compared to so many leaves). If the physician is skilful and diligent in his application, and the patient obedient and respectful, so will the latter soon be delivered from disease.

Sixth Chapter. Recapitulation of the three last chapters. According to the former metaphor or allegory of the Indian fig-tree, there are three roots (or trunks): 1, the root, place, or ground of the disease; 2, that of the symptoms, and 3, that of the manner of curing.

There arise from the first trunk (or root) two stems: that of the unchanged state of the body, and that of the changed or diseased state of the body.

From the 2nd trunk (or root) there arise three stems, namely: those of looking on, feeling, and asking (or of inspection of the tongue and urine; of the feeling of the pulse; and of asking after the circumstances of the disease).

On the 3rd trunk there arise four stems: those of the food; of the manner of living or conduct of life; of the medicaments used; and of the operations performed. Therefore, from the three trunks (or roots) their arise nine stems.

The number of the boughs or branches:

Those branching from the stem of the unchanged body are: disease, the seven supports of the body, and the fæces.

On the stem denoting the changed or diseased state of the body, there are the following 9 boughs: cause of disease, accessory causes, beginning or injured parts, place, way, time of arising (or of the fit), fruit or consequence, causes of transition from one into another disease; the reduction of all diseases to heat and cold.

On the stem denoting the symptoms of diseases, there arise the following eight boughs: 2 of inspecting the tongue and urine. Of feeling the pulse, there are 3: wind-pulse, bile-pulse, and phlegm-pulse. And in asking after the circumstances of the disease, there are 3. Altogether eight.

On the stem denoting the manner of curing, there arise the following boughs or branches: 3 of food or meat; 3 of drink or potion; 3 of the manner of living or of the conduct of life; 6 of physic with respect to taste and efficacy; 6 of the assuaging mixtures, with respect to taste and efficacy; 3 of depuratory physic. There are also 3 boughs of medical (or chirurgical) operations. Thus in all there are 47 boughs or branches.

The number of leaves (or of leafy branches) issuing from the 47 boughs:

1st. On the top of the unchanged stem, the enumeration of 25 diseases.

2nd. On the top of the stem denoting the changed or diseased state of the body, 63 symptoms or tokens of indisposition.

3rd. On the top of the stem of inspection (or examination of the tongue and urine), 6 branches or leaves of inspection.

4th. On the top of the stem of feeling, three sorts of pulse (or three manners of beating of the pulse).

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On the stem denoting the manner of curing, there arise the following boughs or branches: 3 of food or meat; 3 of drink or potion; 3 of the manner of living or of the conduct of life; 6 of physic with respect to taste and efficacy; 6 of the assuaging mixtures, with respect to taste and efficacy; 3 of depuratory physic. There are also 3 boughs of medical (or chirurgical) operations. Thus in all there are 47 boughs or branches.

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5th. On the top of the stem of asking the patient about the circumstances of the disease, 29 questions.

6th. On the top of the stem denoting the food (diet, meat, and drink or potion) of the patient, there are the enumeration of such, as : 14 in respect to wind ; 12 to bile ; and 9 to phlegm.

7th. On the top of the stem of the conduct of life, 6.

8th. On the top of the stem of physic nine tastes and nine efficacies are enumerated, together 18 ; 3 kinds of soup or broth ; 5 kinds of medical butter or sirup ; 4 kinds of potions ; 4 kinds of powders ; 2 kinds of pills ; 5 kinds of powdered aromatics ; 9 sorts of depuratory application. Total,=50 kinds of physic.

9th. On the top of physical (or chirurgical) operations, 7 leafy branches.

A summary exhibition of the above specified leaves :

1. On the trunk denoting the place and ground of diseases, there are 188 leaves.

2. On that denoting the symptoms, 38.

3. On that denoting the manner of curing, there are 98 leaves. Altogether making 224.

There are two blossoms : health and a long life.

There are three fruits : moral perfection (or good morals), wealth, and happiness.

These are the contents of the six chapters of the first part of this medical tract.

SECOND PART.

There are four things to be treated of in the doctrine of curing or healing : 1, What is to be cured or healed ? 2, With what is it to be cured ? 3, In what manner is it to be cured ? 4, By whom is it to be cured ?

1st Chapter.—With respect to the first question, What is to be cured ? the answer is : the disease in the human body. 2, By what means : By diet or regular food, exercise, medicament, and by chirurgical operation. 3, In what manner is it to be cured ?—so that the patient recovering from his sickness, may remain long alive. To this place belongs the examination of the symptoms, the rules of curing, and the manner in which the cure is performed. The contents of this part of the treatise are reduced to four roots, and to 11 branches or minor parts.

2nd Chapter.—Cure is ordained for the well-being of the body. The origin or generation of the body. Cause, and accessory causes thereof. Tokens or signs of birth.

The cause of the generation of the body is stated to be : the father's seed, the mother's blood, and the arising of consciousness. If the first be predominant, there will be born a son ; if the second, a daughter ; if both are equal, then a hermaphrodite. Should it happen that the blood be formed into two masses, then twins will be born.

Out of the semen are formed : the bone, the brain, and the skeleton of the body. Out of the mother's blood are generated the flesh, blood, heart, with the other four vital parts, (lungs, liver, spleen, kidneys,) and the six vessels or veins. From the soul or vital principle arises consciousness through the several organs.

After the body has been thus conceived, the cause of its increase is in the two veins on the right and left sides of the womb, in the small vessel containing the mother's blood for menstruation, and in the chyle formed from the mother's food, which successively descending into the womb, concurs to the coagulation

or union of the semen, blood, and the vital principle, and to their increase, in the same manner, as water is conveyed, by certain canals, from a watering pond, to a field, for the production of corn.

The body, by the agitation of the (inward) air, being changed during 38 weeks, goes on continually increasing, for nine months.

The continual increase of the fœtus, or embryo, is thus: In the 1st week, it is like a mixture of milk and blood. In the 2nd week, growing somewhat thick, it is of a ropy or tenacious nature. In the 3rd week, it becomes like curds. In the 4th week, from the form, which the embryo takes, is conjectured whether it will be a son, daughter, or hermaphrodite. In the 1st month, the mother suffers both in her body and mind several disagreeable sensations.

In the 2nd month, in the 5th week, the navel of the body is first formed. In the 6th week, the vital vein (or artery), depending on the navel. In the 7th week, the forms of both eyes appear. In the 8th week, in consequence of the forms of the eyes the form of the head arises. In the 9th week, the shape of the upper and lower parts of the trunk or body is formed.

In the 3rd month, in the 10th week, the forms of the two arms and sides (or hips) appear. In the 11th week, the forms of the holes of the nine organs become perceptible. In the 12th week, the five vital parts (heart, lungs, liver, spleen, veins,) are formed. In the 13th week, those of the six vessels.

In the 4th month, in the 14th week, the marrows in the arms and thighs are formed. In the 15th week, the wrists of the hands and the legs of the feet are perceptible. In the 16th week, the 10 fingers and the 10 toes become visible. In the 17th week, the veins or nerves, connecting the outer and inner parts, are formed.

In the 5th month, in the 18th week, the flesh and fat are formed. In the 19th week, the tendons or sinews and the fibres are formed. In the 20th week, the bone and the marrow of the feet are formed. In the 21st week, the body is covered with a skin.

In the 6th month, in the 22nd week, the nine holes of the organs are opened. In the 23rd week, the hair on the head and on the body, and the nails commence to grow. In the 24th week, the viscera and vessels become entirely finished; and then pleasure and pain is felt. In the 25th week, the circulation or motion of air or wind commences. In the 26th week, the memory of the mind begins to be clear.

In the 7th month, the 27th to the 30th week, the whole body comes to entire perfection, or is completely formed.

In the 8th month, from 31st to 35th week, the whole body, both within or without, greatly increases.

In the 9th month, in the 36th week, there arises a disagreeable sensation in the womb. In the 37th week, there arises a nauseous sensation. In the 38th week, the head turning to the entrance of the womb, the birth takes place. But, though the months are completed, yet, on account of the mother's menstruation, and of wind, birth may for some time be delayed.

Farther it is stated, that if the right side (of the pregnant woman) is high, and the body light, there will be born a son; if the left side is high, and the body heavy, then a daughter; if they both are in an equal state, an hermaphrodite. And if the middle or both the sides are high, then twins will be born.

The tokens and circumstances of approaching birth are then described.

(This may be seen at large, in the Kah-gyur, in the work entitled དཀའ་བའི་མདོ་འཇུག "d,Gah-vo m,ñal h,jug" Nanda entering into the womb.)

3rd Chapter.—The several members of the body are likened to certain things, 32 in number.

The manner of the existence of the body, under four distinct heads: 1. The quantity (in measure or weight) of the several constituent parts of the body, and the manner of existence of those parts on which the body depends. 2. The state of the veins and nerves. 3. On the nature of diseases, the enemies of the body. 4. The holes or openings for the circulation of the air, &c.

With respect to the 1st:

1. The quantity of the wind or air (in the body) is equal to one full bladder: that of the bile to the quantity of ordure once discharged; that of the phlegm—to one's three two-handfuls (the two hands three times full); that of the blood and ordure to seven ditto; that of the urine and serum to four ditto; that of the grease and fat to two ditto; that of the chyle and the semen to one handful; that of the brain to a single handful; that of the flesh=500 hand-fuls; (one handful being as much as can be enclosed once in a single hand.) Women have an excess of 20 more on account of their thighs and breasts.

There are 23 sorts of bones; in the back-bone, 28 are distinguished. There are 24 ribs; 32 teeth; 360 pieces of bones. There are 12 large joints of limbs;—small joints, 250. There are 16 tendons or sinews, and 900 nerves or fibres; 11,000 hairs on the head; 11 millions of pores of the hair on the body. There are five vital parts (or viscera) (as the heart, lungs, liver, spleen, and the reins or kidneys); six vessels, and nine openings or holes.—In *Jambu-dwipa* the measure of a man's height is one fathom or four cubits—deformed bodies have only $3\frac{1}{2}$ cubits, measured by their own.

With respect to the 2nd section, showing the state of the veins. There are four kinds of veins or nerves: 1, that of conception; 2, of sensation; 3, of connexion, and 4, that of vitality.

The 1st: From the navel there arise or spread three veins or nerves, one of them ascends to the brain, and is acted on by the dull part of it, generating the phlegm in the upper part of the body. Another nerve (or vein) entering into the middle, forms the vital nerve, and depends for its existence on the vital nerve of passion and blood; that part of it, which causes bile, resides in the middle. The third nerve (or vein) descends to the privy parts, and generates desire both in the male and female. That part of it, which produces wind, resides in the lower extremity.

The 2nd: There are four kinds of the nerves of existence or sensation.

For rousing (or exciting) the organs, in their proper place, there is in the brain a principal nerve, surrounded with 500 other smaller ones. Another nerve for making clear the organ of recollection or memory, resides in the heart, surrounded with 500 other smaller ones.

That nerve, which causes the increase and renovation of the aggregate of the body, resides in the navel, surrounded with 500 other smaller ones.

That nerve, which causes the increase of children, and descendants, resides in the privy member, together with 500 other smaller ones—and comprehends or encompasses the whole body.

The 3rd: The nerve of connexion consists of two kinds, white and black. There are 24 large veins (or nerves), which, like as so many branches ascending

the principal stem of the vital principle, serve for increasing the flesh and the blood. There are eight large hidden veins or nerves for making the connexion of the diseases of the viscera and vessels.

There are 16 conspicuous veins connecting the outward limbs, and 77 others spreading from them, called བཀའ་སྲུ bleeding veins (that may occasionally be opened to let out blood).

There are 112 hurtful or pestilential veins (or nerves); of a mixed nature, there are 189 others. Thence originate 120 in the outer, inner, and middle parts, that spread into 360 smaller ones. Thence smaller ones encompass the body as with a net-work.

There are 19 strong working nerves, which, like roots, descend from the brain, the ocean of nerves; from among them there are 13 that are hidden, and connect the intestines—six others, connecting the outward parts, are visible; from them spread 16 small tendons or sinews.

There are three vital nerves (or veins) in a man. The one encompasses both the head and the body; the second, associating with respiration, moves accordingly; the third is the principal, and connecting the veins or canals, for the circulation of air and blood, is occupied with generating or increasing the body, and being the vital nerve, is called, by way of eminence, the artery or the principal vital nerve.

With respect to the third point:

Diseases of consequence happen in the flesh, fat, bone, tendons, nerve, intestines, and veins.

Such diseases are counted in the flesh, 45; in the fat, 8; in the bone, 32; in the tendons or sinews, 14; in the intestines, 13; in the veins, 190. On the head, there are 62; on the neck, 33; in the trunk of the body, 95; in the four hanging members (two hands, two feet), 112. Thus important diseases are reckoned 302, of which 96 are said to be very dangerous, which cannot be cured by any expence or skill. There are 49 that are dangerous in a middle degree, but which may be cured by learned physicians. The rest may be cured by others also; since they are of no great consequence, though they also be reckoned among diseases of magnitude.

With respect to the fourth point:

Of the several orifices or passages for the conveyance of air, blood, drink, and food, both within and without, are enumerated 13 in males and 16 in females.

Through inconvenient food and exercise, these passages being hurt, there arises a distemper of the body, by the humours being either too much increased, issued, or hindered; or by taking wrong direction, confusion is produced. When the passages are clean, and free from any hurt, then the body is in a healthy state.

5th Chapter.—Characteristic description of the body. There is a two-fold division: 1, Those parts which are subject to injury (the body). 2, Those things by which they are injured (bad humours or diseases). First, of those that are subject to injury. These are thus distinguished: the supports, (or those parts which keep the body together), seven in number; as, the chyle, blood, flesh, fat, bone, marrow, and semen. Excrements, as ordure, urine, and sweat; also the dirt of the teeth, and under the nails, and the impurity issuing from other openings or passages.

1stly. The office of the seven supports of the body, and of the three excrements, is thus described:

The meat and drink, after being digested in the stomach, are changed into chyle and fæces. These turn into ordure and urine, that is, for the nutrition of the body, by increasing the blood. The blood preserving the moisture or humidity of the body, keeps up life, and increases the flesh. The flesh covering and cleansing the body, both within and without, produces the fat. This makes the whole body unctuous, and causes the increase of the bone. This supports the body and increases the marrow. This improves the essential sap of the body, and produces the semen virile. This conduces to the well-being of the whole body, and to the production of a new one.

The service, rendered by the fæces, is: the ordure serves for the support of the bowels, guts, &c. By urine, morbid humours are carried off; and it serves also for a support of the thinner fæces, and carries off the putrid thick sediments.

The office of sweat is to soften the skin, and to change the obstructed pores of the hair of the body.

Fire-warmth མེ་དྲོད་ is the common gentle warmth, or heat, of the whole body. The warmth of the stomach is the principal cause of the digestion of meat and drink of every kind. If this warmth is in good state, the digestion of meat and drink is easy; no diseases then arise, the lustre of the face, the chyle, the supports of the body and life, then increase. Therefore, the warmth of the stomach must be kept up, (or if lost, must be restored,) with every endeavour.

The manner in which meat and drink are changed. Whatever is eaten or drunk, is carried into the belly or stomach, by the vital air or wind; afterwards, by the aid of phlegm, it comes into fermentation of a sweet taste, and increases the quantity of phlegm. Afterwards, being digested by the aid of bile, taking a hot and sour taste, it produces bile. Afterwards, by the aid of the air or wind that conveys an equal heat to the whole body, the dregs or fæces being separated, and taking a bitter taste, it generates thin wind. The fæces being changed into thick (or solid) and thin (or fluid) parts, become ordure and urine.

The chyle, after having passed by nine veins from the stomach into the liver, it becomes or changes into blood; afterwards, successively, it is transformed into flesh, and the seven supports of the body.

2ndly. The hurtful things or bad humours. These are three: wind, bile, and phlegm, each with a five-fold division.

1. Of Wind. The life-keeping wind or air resides in the upper part of the head; that which operates upwards, has its place in the breast; that which pervades or encompasses all, resides in the heart; that which communicates or conveys an equal heat to the body, has its seat in the stomach; that which cleanses downwards, abides in the lower part of the trunk.

2. Of Bile. The digesting bile resides in the stomach, between the digested and indigested part; that which forms the chyle, resides in the liver; that which prepares or increases, in the heart; that which assists the sight (or causes to see), in the eye; that which gives a clear colour, resides in the skin.

3. Of Phlegm. The supporting phlegm resides in the breast; the masticatory, in the indigested part; the tasting, on the tongue; the refreshing (or that makes contented), in the head; the conjunctive or uniting, resides in every juncture (or joint).

The characteristic signs of the above-specified humours—that of wind; roughness, lightness, cold, smallness, hardness, and mobility.

That of bile; unctuousness, sharpness, lightness, foulness, depuratory moisture.

That of phlegm: unctuousness, coolness, heaviness, and dulness, softness, or gentleness, steadiness, adhesion, passionateness.

6th Chapter.—On the works or action of the body. These are the body, the speech, and the mind. Virtue, vice, and undetermined cases. The five organs occupy their own place. The body is divided into basis (ground or support), age, nature (or constitution), division of diseases. The basis has a triple division. Age also has the same number; that of nature or native disposition, has seven. With respect to disease, the distinctions are: indisposition and absence of morbid state.

7th Chapter.—On the tokens of destruction (or approaching death) of the body: 1. Tokens of a far distant death. 2. Ditto of a near one. 3. Uncertain, and 4, Certain tokens of death. Distant tokens are: any envoy (of death), dream, and change (by age), &c.; the near tokens are distinguished into near and very near. Uncertain tokens; as, when after recovering from a sickness, one may live yet many years. Certain tokens, as, when the disease is incurable.

A physician should be well acquainted with the tokens of death; that he may know whether the patient be curable or incurable, and to perform his medical service accordingly.

8th Chapter.—On the increasing and decreasing state of sickness. Here is treated of the causes and accessory causes of the disease; the manner of its origin; the diseased part; the character and distinctions of the importance of each.

First. The causes are proximate, and remote.

9th Chapter.—There are three accessory causes that depend on the primary cause: the originating and spreading, the gathering together and arising; and the taking away of the disease.

10th Chapter.—On the manner in which any disease takes place in the body.

11th Chapter.—On the character of diseases; as, an increasing, diminishing, and a perplexed, disease. The causes of which are to be sought in the too great or too small quantity of the three humours, of the seven supports of the body, and of the fæces.

12th Chapter.—Division of diseases; with respect to the cause, the individual, and the kind of disease. With respect to the cause: this is attributed to the vicious three humours of this life; to the consequence of immoral actions in former generations or lives, and to a mixture of both. With respect to the individuals: they are, man, woman, child, old persons; and men of every description. The several diseases peculiar to each are enumerated. The number of the kinds of the common diseases is stated to be 404, which are divided or distinguished out of several respects. As with respect to the vicious humours, principal humour, place or injured part, and the kind of disease, 42 belong to wind, 26 to bile, 33 to phlegm. Thus with respect to the humours, 101 divisions are made, and so on; with respect to the other points also, many distinctions or classifications are enumerated, each amounting to 101.

13th Chapter.—With respect to the conduct. What course of life is to be taken, (to be free from disease:) 1. continually, 2, at certain periods, and 3, occasionally, or as circumstances may require. The two first are treated in the

next two chapters: 1, continually to be done are: worldly affairs and religious exercises or occupations; first, the leaving off every immoral action committed by the body, speech, and the mind; and the doing of such things as are agreeable to these, in every circumstance of life: as in eating, walking, sitting, mounting a horse, sleeping, &c.

2, Religious occupations are the exercise of moral virtues, and the desisting from the ten immoral actions.

14*th Chapter.*—On the periodical conduct of life, according to the different seasons, (as the first and last part of winter, the spring, the hot season, summer, and autumn;) with respect to diet, exercise, medicine, and chirurgical operations.

15*th Chapter.*—On the circumstantial conduct of life, with respect to several cases, teaching that, one should not obstruct hunger and thirst (or abstain from meat and drink); not hinder yawning or gaping, sneezing, breathing, coughing, (or ejecting phlegm,) spitting, sleeping, nor any of the natural discharges, since the obstruction or hindrance of them may give rise to any disease, of which several cases or examples are enumerated.

16*th Chapter.*—The manner of using meat and drink: 1. The several kinds of food, and the manner of using them. 2. Several kinds of food that do not agree, and therefore may not be used together. 3. Temperature to be observed.

For food are used, grain (or corn), flesh, butter, vegetables or greens, and dressed victuals. There are two kinds of grain: 1, growing in ears, and 2, in pods (as pulse). Flesh or animal food of eight kinds or sorts. Several kinds of unctuous or oily substances; as, butter, oil expressed from grains, kernels, fruits, berries, and trees or shrubs; grease, fat, marrow, &c. To vegetable or green things belong potherbs, &c. To dressed victuals or meals belong boiled rice, soup, &c. Drinkable things are milk, water, wine, &c.

17*th Chapter.*—Enumeration of several kinds of food that it were dangerous to take together; as, fish and milk, &c.

18*th Chapter.*—On the proper measure of food to be taken, or on temperance in meat and drink.

19*th Chapter.*—On pharmacy, or the preparing of medicaments for healing any disease. Taste of medicament, efficacy, digestive quality, mode of composing, &c. appropriate to any specified disease.

20*th Chapter.*—On materia medica, the efficacy of every simple medicament. The materials for medicaments are: precious and natural stones, earths, woods, vegetables, and those obtained from animals. In the text, and in another quoted work, 915 articles are enumerated, and stated of each to what disease it may be applied especially, as a remedy.

21*st Chapter.*—Specification of the classes of medicaments; their preparation and application to specified diseases.

22*nd Chapter.*—On the five sorts of (chirurgical) instruments, employed in trying or sounding any disease, in cutting, &c.

23*rd Chapter.*—That one may remain in health and ease, rules are prescribed to be observed.

24*th Chapter.*—Discrimination of the humours as the cause of any inward or outward disease.

25*th Chapter.*—When the former are insufficient, it is taught, to seek it in the vicious inclination of the mind.

26*th Chapter.*—To exhibit medical help, when the disease may be healed; and to give it up, when it cannot be cured.

27*th Chapter.*—On the manner of curing diseases. How? by whom? with what? The measure or length of time of curing.

28*th Chapter.*—Detailed description of the curing of diseases.

29*th Chapter.*—Common and peculiar mode of curing diseases.

30*th Chapter.*—How to cure wind, bile, phlegm, is separately exposed or taught.

31*st Chapter.*—The requisite qualities in a physician, that he should be well acquainted with the theory and practice of medicine; and be an impartial, upright, good-hearted man.

Third Part.

Containing a full explanation of Diseases.

Chapter 1. Exhortation to the teacher (Sha'kya) to deliver a treatise (རྒྱུད) or oral instruction on the manner of curing diseases.

2. The curing of diseases arising from wind (or windy humours). There are five distinctions: 1, causes; 2, accessory cause and effect; 3, division; 4, symptoms; 5, manner of curing (diseases arising from wind).

3. In the curing of diseases arising from (or caused by) bile, there are the following distinctions: 1, cause; 2, accessory cause and effect; 3, division; 4, symptoms; 5, manner of curing; 6, and stopping or hindering its progress.

4. In the curing of diseases caused by phlegm (or phlegmatical humours), are considered: cause, accessory cause and effect, division, symptoms, and manner of curing.

5. In the curing of diseases caused by the gathering together of the three humours (wind, bile, phlegm,) and of blood, there are the following distinctions or considerations: cause, incident or accessory cause and effect, place, time, kind or genus, symptoms, manner or mode of curing, and the stopping of it for the future.

6. In the curing of indigestion, the root (or primary cause) of inward diseases, there are the following distinctions or sections: cause, incident or accessory cause and effect, manner of its arising, division, symptoms, remedy or mode of curing.

7. In the curing of a swelling (or a hard conglomeration or excrescence), there is treated of: cause, incident, division, place, manner of arising, symptom, mode of curing it.

8. The curing of white swellings, a kind of dropsy. Here are considered: cause, incident, division, symptom, mode of curing.

9. In the curing of another kind of dropsy (རླུང་ཤའི་ཆུ) there are the same distinctions as before.

10. The curing of dropsy is taught, by exposing the cause and incident, division, manner of arising, symptom, mode of curing, stopping or cessation.

11. In the curing of phthisis or consumption of the lungs, ཐག་ཅད་ཆེན་པོ་རབ་ཏུ་སྐྱེ, there are the following distinctions: cause, and accessory cause or effect, division, symptom, mode of curing. And thus there are six chapters on curing inward diseases.

12. In curing feverish diseases (where heat prevails) in general, there are the

following distinctions: cause and incident, nature, name, symptom, mode of curing.

13, 14. Farther explanations on the causes of the heat and cold, in fever.

15. In the curing of a fever, in its beginning, or where heat has not yet taken the upper hand, there are enumerated the following distinctions: cause and incident, nature, name, division, symptom, mode of curing.

16. In an increased or burning fever, the same distinctions are as before, except a trifling division.

17 to 20. On curing several kinds of fever, such as are: the sly, hidden, inveterate, and the mixed ones.

21. The curing of inflammation of any hurt or wounded part of the body, with several distinctions; and that of inward and outward hurt: the inwards are, the viscera and the vessels; the outward parts are, the flesh, bone, marrow, tendon, and fibre.

22. The curing of heat or fever (arising from the contest between wind, bile, and phlegm), in which the mental faculties are troubled, with several distinctions to be considered; and so there are 11 chapters on curing fever (heat and inflammation).

23. On curing epidemic maladies or infectious diseases, with several distinctions and divisions; as, ཀཉི་ཅེན a kind of pestilence of Nepál.

24. On curing the small-pox: cause and effect, definition of small-pox, distinction, symptom, mode of curing; distinction into white and black variolæ, each having three species.

25. The curing of infectious diseases affecting the bowels (colic), with several distinctions; purging the viscera and the lower vessels, affecting with greater or less vehemence; and so there are eight kinds of diseases affecting the bowels.

26. The curing of swellings in the throat (or of ulcers and inflammations), and infective diseases, as the cholera, མཁའ་པ་དང་སྐྱོབ་པ: the first has 4, the second 11, subdivisions, or minor distinctions.

27. With respect to catarrh, are considered: cause and incident, kind, symptom, mode of curing. And so are five chapters on infectious diseases, རིམས་ཅེན, to which belongs the cholera morbus also, མཉན་ཐུན་ལྷོག་ལོངས། ། ཤ་ལོངས།.

28. In curing the upper part of the body, the head occupies the first place. Here are considered: cause, circumstantial accident, distinction, symptom, mode of curing. There are eight distinctions, as wind, &c.

29. In curing the diseases of the eyes, are considered: cause, incident, division, symptom, mode of curing, with 33 distinctions of opthalmic diseases.

30. Diseases of the ear; cause and incident, or accessory cause and effect, division or distinction, symptom, mode of curing. Distinction into disease of the ear, and deafness; that has six, this four, kinds.

31. Diseases of the nose: cause and incident, division, symptom, mode of curing; there are five divisions or distinctions.

32. In the curing of the diseases of the mouth, there are to be considered: cause and incidents, division, symptom, mode of curing. There is a six-fold division; as, the lip, the gum, &c. There are several distinctions of diseases, as six of the teeth; five of the tongue; six of the palate, and seven of the throat.

33. In curing the diseases of goitre or swelling in the fore-part of the neck, are considered: cause and incident (or accessory causes), distinction, symptom, cure

or remedy. There are eight sorts of goitre, as those arising from wind, bile, &c. Thus six chapters are on curing diseases in the upper part of the body.

Now follows the curing of diseases affecting the viscera, and the entrails or vessels.

34. In curing the diseases of the heart, there is treated of: cause and incident, division, symptom, and remedy. There are seven distinction of diseases in the heart; as the throbbing or palpitation of the heart སྙིང་འཇུམ་, &c. &c.

35. In curing the diseases of the lungs are considered: cause, division, symptom, remedy. There are eight distinctions of diseases.

36. In curing the diseases of the liver, are treated of: cause, division, symptom, remedy. There are 18 distinctions of diseases.

37. In curing the diseases of the spleen or milt, four things come into consideration. There are five kinds of diseases, as inflammation, &c.

38. In curing the diseases of the reins or kidneys, there are four considerations, with seven kinds of diseases; as wind in the reins, &c.

39. In curing the diseases of the stomach, or the pit of the stomach, there are likewise four things to be previously considered. And first, 16 kinds of diseases, as heat, cold, &c. and again five kinds, as wind, &c.

40. In curing the diseases of the intestines or bowels are considered four things, as cause, &c. with the distinction of five kinds of diseases.

41. In the curing of the gut of the entrails or bowels, are considered: symptom and remedy, with five distinctions of diseases; as cold, puffing up, &c. Thus eight chapters are on curing the diseases of the viscera and vessels དེ་ནས་སྐྱེད་.

Diseases of the privy parts.

42, 43. In these two chapters for male and female cases are considered: cause, &c. four, with nine and five distinctions of disease respectively.

This class of disorders is called གསང་ནད་ (secret disease).

The curing of little diseases (ཕྲ་ནད་).

44. In the curing of hoarseness, or difficulty of using the voice, are considered: cause, incident, &c. four, with seven distinctions of diseases; as wind, &c.

45. In curing aversion from food, or restoring the loss of appetite (ཡི་མ་འཚལ་པ) there are considered: cause, &c. four; with four distinctions of that disease.

46. In curing the distemper of continual thirst, are considered: cause and incident, &c. four, with five kinds of that distemper; as wind, bile, &c.

47. In the curing of the hiccup, the disease of yexing (convulsion of the stomach རླུང་བྱའི་ནད་), are considered: cause and accident, &c. four, with five distinctions of that distemper; as from meat or food, &c.

48. The curing of the difficulty of breathing: cause, &c. four; with five minor distinctions.

49. The curing of a sudden cholic, (སྐད་ཅིག, a distemper of the bowels,) are considered: cause and accident, &c. four; with three principal, and eleven minor, kinds of that distemper; besides some others that are enumerated, as heat and cold; worms and phlegm, &c.

50. The curing of diseases arising from worms (in the belly or bowels:) and insects, are considered: cause and accidents, &c. four, with two distinctions inward and outward worms or insects; as belly worms, lice, and nits.

51. In curing vomiting, are considered: cause and accidents, &c. four, with four distinctions of that distemper, as wind, &c.

52. In curing purging diseases (or dysentery), are considered: cause, &c. four, with four distinctions of that distemper, &c.

53. The curing of obstruction of stools, or of evacuation, four things to be considered, and five kinds of that distemper are enumerated.

54. In curing dysury (or difficulty of making urine), is treated of the cause and accidents, &c. four, with several distinctions of the kinds of that distemper.

55. In curing the frequent discharge of urine; cause, &c. four, with the three kinds of that distemper, arising from phlegm, bile, and wind; phlegm has again 10 distinctions.

56. In curing the disease called the "Indian heat," (very dangerous to Tibetans, by causing excessive heat and frequent evacuations, of which many die who visit India,) are considered: cause, &c. four, with four distinct divisions of that distemper.

57. In curing the swelling or enlargement of the feet, are considered: cause, &c. four, with four distinctions of that disease.

58. In curing the gout རྨུགས་ are considered: cause, &c. four, with six distinctions of that painful distemper.

59. In the curing of diseases arising from the serum or watery parts of the blood (ཆུ་སེར་ yellow water, bad or corrupt humours), are considered: the manner of its origin, its division, symptom, mode of curing, with several distinctions.

60. The curing of the disease called "the white vein," རྩ་དཀར་ with several divisions and distinctions.

61. The curing of cutaneous diseases. Of these there are several divisions and distinctions.

62. The curing of miscellaneous diseases of the smaller kind: such as contraction or sinking of the sinews; dysentery; vomiting; any hurt caused by fire; hurt or wound made with a needle; or when a needle or the iron-point of an arrow happen to be swallowed; choaking or suffocation; on the stopping of any thing in the throat, as, a beard of corn, bone, fish-prickle; the entering or swallowing in of a spider or scorpion; intoxication; stiffness of the neck; ill smell of the body; hurt of the hands and feet caused by cold and snow; the creeping of any insect into the ear; the swelling of the teat of a woman. The curing of all such diseases is called the cure of small diseases. Thus there are 19 chapters on minute diseases.

The healing of wounds, sores, or ulcers.

63. The curing of ulcers (འཕྱེད) here are considered: cause, &c. four, with several distinctions.

64. The curing of the hemorrhoids (piles or emerods in the fundament, མཁྲང་འཇུམ): cause, &c. four, with six distinctions.

65. The curing of St. Anthony's fire, (any swelling full of heat and redness, མེ་དཔུང): cause, &c. four, with several distinctions, and the places (or parts) where generally they occur.

66. The curing of the Surya disease (ཉི་ཁྲི་ཀོད་) affecting the lungs, liver, &c. its beginning, &c. four, with some distinctions.

67. The curing of cancerous or virulent bad sores or ulcers: cause, &c. four, with eight distinctions.

68. The curing of the swelling of the testicles (རྡོག་སྐྲ་བཅས) : cause, &c. four, with six distinctions.

69. The curing of a disease in the foot and thigh, called Káng-bám, (རྐང་འབམ or enlarging and corruption of the feet, &c. a painful disease in the bones, accompanied with inflammation, and blue colour of the skin : cause, &c. four, with several distinctions.

70. The curing of the ulceration in the perineum : cause, &c. four, with some distinctions.

71. The curing of diseases incident to infant children, with the description of several superstitious customs or practices which are performed at the birth of a child, as examination of the time at which it was born, whether it is lucky or unlucky; imparting of the benediction; the cutting of the umbilical cord; the making it live long; the making it suck, the time, &c. &c.

72. The enumeration of several diseases common to infants and children : cause, &c. four, and the mode of curing them.

73. The curing of diseases caused by any (supposed) evil spirit, 12 kinds of such diseases: symptoms, and remedy.

Thus three chapters are devoted to the diseases of infant children.

Then follow, on curing the diseases of the female sex. These distempers are thus distinguished : general, peculiar, and vulgar, or common.

74. On curing the diseases of the female sex, in general, are considered : cause, &c. four, with two distinctions, originating in the blood and wind.

75. The curing of the particular diseases of women : cause, &c. four, with many distinctions; as with respect to the several humours, of which they arise.

76. The curing of the common or vulgar diseases of women, with the circumstances of child-birth.

On curing diseases caused by evil spirits.

77. The curing of diseases caused by a ghost (or evil spirit), of which there are 18 kinds enumerated, from among the Suras and Asuras. Here are considered : cause and incident, division, symptom, and remedy.

78. The curing of insanity or madness : cause, &c. four, with seven distinctions, as it is caused by wind, bile, &c.

79. The curing of a kind of insanity called "forgetfulness" (lunacy?) enumeration of its several kinds, the symptoms, and the remedies.

80. The curing of palsical diseases, and the telling of the periodical time of their occurrence, the symptoms, and the remedies for preventing their recourse.

81. On the curing of diseases, in which the body is infested with cancerous ulcers, is eaten away and dissolved : considered cause, &c. nine, with 18 distinctions respecting its different kinds, and the places (or parts) which are generally affected.

The above five chapters are on such diseases as are supposed to be caused by the influence of some malignant demon.

82. On the curing or healing, in general, of wounds, made by any kind of weapon or tool. Here into consideration come ; 1, cause ; 2, accessory cause or incident; 3, nature (of wound); 4, definition or description (of the wound) ; 5, its name ; 6, place ; 7, division ; 8, symptom, mode of curing or remedy, excision or cutting out, cicatrizing.

83. The curing of wounds on the head, here are considered : the manner of its being, examination of the injured part, manner of curing, recovering, or being overpowered. (འབྱུང་མཁོན)

84. The curing of wounds on the neck or throat, where the bone, vein, or nerve, and the tendon or sinew come into consideration.

85. The curing of wounds on the upper and lower parts of the thumb of the body; manner or that of being; symptom, remedy, healing.

86. The curing of wounds on the hanging members (arms and legs), the knowing the importance or consequence of, &c. symptoms in general, mode of curing, or restoration.

Thus four chapters were on curing wounds; henceforth the curing of poison, or the remedies against poisoning.

87. The curing of injuries caused by artificial or prepared poison. Here are considered: the kind of poison, entrance or infection; quality, the manner of its spreading or prevalence; remedies employed, final cessation or remains.

88. The curing of simple poison, and of poison in the flesh. With respect to the first: cause, symptom, remedy; in the second case, two points more come in consideration.

89. The curing of real or material poison. Two cases: 1, spreading; and 2, not spreading. (སྲིན་པ་དང་མི་སྲིན་པ)

These three chapters were on curing injuries caused by poison.

90. On curing the weakness of old age, or procuring strength to weak, old men. Emoluments, place, recourse to, remedy.

91, 92. On the means of increasing the power or vigour in men.

Here ends the summary extract of the 92 chapters, on the instruction of curing diseases.

FOURTH PART.

Which contains the explanation of the practical part of Medicine.

Chapter 1. The examination of the pulse, wherein 13 cases are enumerated on the character of the distemper.

2. The inspection of urine, wherein, as it is said, the vicious state of the whole body may be seen, as in a mirror.

Thus two chapters are on examining the pulse and urine.

Afterwards, when the character and name of the disease has been found out, what sorts of medicaments are to be administered, is exposed.

3. First liquid medicines, of which there are 54 for curing inward heat, and 23 for assuaging cold fits or ague. Together there are 77 sorts of liquid medicine. When by these there is no remedy, further is an

4. Enumeration of powdered medicine, or medicaments in powder, of which the mixture is stated to amount to 96, for assuaging the heat of any distemper; and 69 against cold fits. Both together=165. When they afford no relief, there is taught of another remedy,

5. Physic or medicaments in pills, of which the different kinds of mixture amount to 22.

6. The several kinds of sirup, (a kind of mixture) are described or taught, of which 15 are for assuaging heat, and five against cold fits. Both together=20.

For procuring strength to the body, and for drawing out an inveterate disease.

7. Is taught of a mixture, called medicinal butter (སྐོག་མཇེ) consisting of

several ingredients, of which there are 14 sorts for curing heat, and nine for taking away cold fits. Both together = 23.

8. 13 kinds of mixture of calcined powder, for curing an ague caused by a too much abundance of phlegm.

9. 17 kinds of mixture or syrup, especially for the purpose of assuaging heat.

10. 19 species of mixture of medicinal wine (or spirituous beverage), are enumerated, for curing diseases, in which wind prevails.

11. A mixture, as a remedy against any inveterate malady whatever, prepared of precious stones, for curing the diseases of princes, and of opulent men. One against heat, and 11 against cold; eight against both; together=20.

Since men, in general, cannot have precious stones required for such a mixture for curing diseases, in the

12. Is taught of such vegetables or plants that are procurable by all, of which the several mixtures amount to 28 for curing heat; and 14 for assuaging cold fit.

Thus taking together all assuaging remedies from the liquid to the vegetable medicines, there are 418. So much of the assuaging remedies. When they are insufficient, in the

13. Is taught of purging or deparatory medicines in general.

14. Of purging medicines operating downwards, for carrying away corrupt blood, bile, and the relics of other diseases. There are three kinds of such purging (or depuratory,) medicines, operating: gently, moderately, and strongly; of which all there are 82 species.

15. For carrying upwards or ejecting the remains of such diseases, as belong to the phlegmatical kind: here vomits are prescribed, of which there are eight of the stronger, and eight of the gentle kind, both=16.

16. A composition of medicine, for cleansing or purging the nose, five of the gentle, and two of the strong kind.

17. Elixirs or extracted juices, for drawing downwards the diseases in the entrails or intestines and guts.

18. The same continued and specied.

19. Elixirs or mixtures for cleansing the veins, (or deparatory elixirs for do.) Thus seven chapters are on deparatory medicines.

If by the above means there is no sufficient relief, in another sutra is taught of other soft and hard remedies.

20. How to let blood in such distempers, when heat prevails. There are counted 77 veins, of which any may be opened for letting out blood.

21. The application of a caustic for curing diseases, when cold, or cold fits prevail.

22. The use of a venomous mixture.

23. On the use of medical bath, for diseased members.

24. On adhibiting medicinal unguents.

25. On medicines operating downwards.

26. The conclusion. Though there be many ways (1,200) of examining the heat and cold prevailing in any disease, they all may be reduced to the following: to look on the tongue and urine, to feel the pulse, and to ask (after the circumstances of the beginning and progress of the disease in question.)

Thus the remedies adhibited against diseases, though they be counted many (1,200) yet they may be reduced to the following four classes: medicament, manual operation, diet, and exercise. Medicament is either assuaging or deparatory;

the manual operation, is either gentle or rough; food is either useful or noxious; the exercise is either violent or gentle.

Again: though there be numbered 360 practical modes of curing diseases, they may be reduced to these three: examination of the patient (or of the symptoms of the disease). Rules for curing such and such disease. And the manner in which the remedy is applied.

There is taught also of preservatives for a physician, to keep himself safe from any malignant infection from a patient.

27. Recommendation of this treatise to the care of the audience, by the teacher, (SHAKYA.) Classification and moral application of the above enumerated 404 diseases.

The volume concludes with an account of the mode in which this treatise on medicine (consisting of four parts) reached Tibet, which is briefly incorporated in the introductory remarks.

II.—*Journal of a Tour through the Island of Rambree, with a Geological Sketch of the Country, and Brief Account of the Customs, &c. of its Inhabitants. By Lieut.* WM. FOLEY.

[Read at the Meeting of the 2nd Oct. 1834.]

The Island of *Rambree*, or *Yamawaddi** as it is termed by the Burmas, is not without those features common to the whole of Arracan. The same high land, covered with a thick and impenetrable jungle, every where presents itself to the view of one approaching the coast; and the eye strives in vain to discover a diversity of feature in some cleared spot, which would indicate the existence of a cultivation only to be found in the interior of the island. It was with the view of throwing some light upon the geology of *Rambree* that I prepared this Journal for transmission to the Asiatic Society; a consciousness of my present superficial information on many points connected with the geology of the island would have induced me to reserve this communication for a more favourable opportunity, was I not apprehensive that such a season would never arrive, and that the little leisure I now have at my disposal must of necessity be devoted to duties of a

* In the year 1148, Mugh series, two years subsequent to the conquest of the country by the Burmas, Arracan was divided into four distinct provinces, each subject to a separate jurisdiction. They were termed thus, 1. *Dwynawaddi* (Arracan Proper). 2. *Yamawaddi* (Rambree Island). 3. *Megawaddi* (Cheduba). 4. *Dorawaddi* (Sandoway). The proper name for Cheduba is *Ma'ong*. The word Cheduba must have been introduced by the Bengalís, I fancy, for it is unknown to the Mughs. The same may be said of Akyab, which should be called *Chetówa*.

[*Rámávati*, *Meghávati* and *Dvárávati*, in Sanscrit. See translation of an Inscription in vol. iii. page 209, 213.—ED.]

professional nature. To a brief geological description of the island, I have added such other matter connected with the condition, and manners of the inhabitants as appeared deserving of mention, either from its novelty, or the value it may possess in the scale of utility.

With respect to the geology of *Rambree*, I fear there will be found little that is new or interesting; the rocks that have been hitherto observed are chiefly of the newest kind, or owe their origin to volcanic agency: these with the alluvial and diluvial deposits will be found to cover the greater part of the island. Several mountainous ranges occur in *Rambree*, and their general direction appears to be from N. N. W. to S. S. E. The elevation of these above the plain is not very great, varying from 500 to 1500 feet for the principal extent, and not exceeding 3000 feet at the highest point. Other smaller hills are seen to branch off from the larger ranges, forming those basin-like cavities that afford space for the rice cultivation.

Commencing with *Khyouk Phyoo**, situated on the N. W. point of the Island of *Rambree*, I shall proceed from thence along the western coast, passing in gradation to such other places as I may have visited, or have become familiar to me from the report of others.

The military station of *Khyouk Phyoo*, which takes its name from a village distant three miles from the cantonment, stands upon the verge of a low sandy plain, which extending from the south towards the sea and harbour is bounded on the S. W. by a low sandstone range, and on the E. by a small creek, which separates it from the rich alluvial ground that lies at the base of the *Nagadong* and *Oonkyoung* hills. Upon the surface of this plain there exists a vegetable mould not exceeding four inches in depth, and this is succeeded by a bed of sand and shingle; the sand in some instances assuming a grey or greenish appearance, and the shingle in every respect similar to that found upon the beach. At the village of *Townyeen*, in front of the parade, a chalybeate spring is supposed to exist from the presence of carbonate of iron;—the sand in this place has a ferruginous aspect, but the space occupied by it is very limited, the ochre appearing at the surface, and invariably succeeded by the grey sand above alluded to.

As has been already observed, a sandstone range extends itself on the S. W. side of the cantonment. There are in fact two ranges running parallel to each other, the interval being taken up with patches of rice cultivation; and both are connected with the reefs extending under the sea to the N. W. and marked off by the *Reef Buoy*. Taking a direction to the S. E. they are terminated abruptly on the margin of the creek which bounds the station of *Khyouk Phyoo* on

* *Khyouk Phyoo*, White Stones, (Shingle.)

that quarter. The structure of both is alike throughout; the sandstone occurring in large disintegrated masses, rounded by the weather, and loosely embedded in the argillaceous soil that forms the surface of these hills. Here and there some appearance of stratification is observed; the sandstone dipping to the S. W. at an angle of 75 or 80°. This order of stratification is most perceptible on the sea beach, where the ranges in question are united with the reefs. The sandstone is here of a grey colour, of a somewhat laminar structure, and in some places so much decomposed by the action of the water as to approach the nature of an aluminous schist. Progressing with the range, it assumes a brown or yellow colour, is of a fine texture, and occasionally interspersed with minute scales of mica. The surface of these hills being composed of a stratum of clay, the ground at their base is continually receiving a deposit of the same nature, affording opportunities for cultivation, and forming a striking contrast with the soil in the immediate vicinity of the cantonment. This alluvial deposit sometimes attains to the consistence of a yellow clay, sufficiently plastic for the fabrication of bricks and earthen vessels. Beyond this sandstone range, and bordering upon the village of *Khyouk Phyoo*, the ground is still of that low diluvial nature which indicates the transition it has undergone; in some places, intersected by narrow creeks accessible to the tide, and every where covered with a thick jungle of mangroves and marine plants. At the village of *Khyouk Phyoo* there occurs an isolated hill, composed entirely of a soft grey sandstone, which had once formed part of some continued range, and was subsequently torn asunder by the sea on its retiring from the island; it is one of the many instances that may be observed in *Rambree* of the denudating effects of the waters of the ocean at a period that they were subject to some violent commotion, produced probably by the sudden rise of mountains from beneath.

January 12th, 1834.—Leaving *Khyouk Phyoo* at an early hour, and proceeding along the beach with the Saddle and Knot Islands on the right, my route lay towards the villages of *Membraan* and *Kyouprath*; loose blocks of standstone, rounded by the sea, and apparently forming part of an under-stratum, extending to the *Saddle* and *Knot Islands*, cross the beach in several places for the first few miles of the road. The sandstone is of a grey colour, soft, gritty, and frequently intersected with veins of calc-spar; I observed crystals of iron pyrites on the surface of some of these stones, and red spots on others, perhaps the result of aqueous deposition. The sandstones in Arracan appear to contain much iron, in different stages of oxidation.

Still following the sea-shore, at the base of a long sandstone range, whose utmost elevation above the plain cannot exceed 300 feet, I passed the village of *Membraan*, the locality of some old Petroleum wells, which I am told no longer afford a sufficient supply of oil to induce the working of them. From *Membraan* to *Kyouprath*, the road lay along a beautiful beach, covered with a fine yellow sand and shingle. I observed the prints of tigers' feet in several places on the route, and in this place they were particularly numerous. From the circuits the animals had made on the beach, they would seem to have been sporting with each other by the moonlight; a thing not unusual with the male and female of the Feline species during the season of love. The ground on the left was higher and more open than it had hitherto been on the road, and covered with a fine green sward. Beyond me was the village of *Kyouprath*, prettily situated on an eminence over the sea-shore, and at no great distance in its rear, the range of sandstone hills, between which and the village I observed a few acres of paddy ground. The hills were in some few places cleared of the forest and underwood, and presented small patches of open ground devoted to the cultivation of cotton. It was near 10 o'clock when I reached *Kyouprath*, and as my elephants were tired, and it was getting warm, I was not unwilling to make a halt at the place for the remainder of the day. After selecting a spot for the elephants, my next care was to seek quarters for myself; and for this purpose, I requested the villagers, who had already assembled to have a near view of the *Inglee**, to direct me to the house of the *Rovagony*, or head-man of the village. After my request had been several times repeated, before it was understood, I at length found myself seated in his house. The *Rovagony* was at work in the field, but his wife, a cheerful-looking woman, was present, and very kindly gave me a mat to lie down upon, some fire for my cheroot, and a fowl for my curry, on the assurance that full payment should be made for every thing received. I fell asleep upon the mat, and did not rise until the sun was nearly down, when I took a stroll upon the beach, and bathed in the sea. A few blocks of sandstone, and a conglomerate, consisting of a paste of sandstone, with enclosed nodules of a calcareous earth, lay upon the beach; some of these rocks had a scoriaceous appearance, were encrusted with crystals of iron pyrites, and bore evident marks of igneous origin. Returning to the village, I sat down on the green, to witness a wrestling match between two young Mughs. This is a game that they are very fond of, and I have never seen better wrestlers among any race of people. The vigorous frame

* Inglee, Englishmen, general term for an *European*.

of the combatants promised a treat of no ordinary kind, and I was not disappointed ; it was truly astonishing to witness the dexterity of the parties in their endeavours to throw each other. The struggle was long and violent, ere it was terminated by the fall of either party ; it was impossible, however, that both should be declared conquerors, one poor fellow was thrown, and fairly held down at the mercy of the victor. One of my Mahouts, a great stout man, and a native of Chittagong, was present, and had the impudence to speak lightly of the *science*. He was immediately challenged by a young Mugh, who was far his inferior in size, as well as age. They wrestled, and the Mahout was thrown, once—twice—and three times, to his very great confusion, and the chagrin of his *caste*. Boxing, wrestling, and the *Keelóme*, are among the favourite amusements of the Mughs. The latter game is not unlike our "battledore and shuttlecock," with this difference, that the ball, which is hollow, and made of cane, is impelled into the air by the foot, instead of by the hand. Half a dozen young men form a circle, and it is the aim of each individual, towards whom the ball falls, to keep it up in the air as long as he can ; not only the foot but the knee is brought into action, much dexterity is displayed, and he that keeps the ball up longest is entitled to the greatest credit. In addition to the games of more general occurrence, the Mughs, like the rest of their neighbours, have their own peculiar festivals, and modes of celebrating them. The principal of these are—

1. *Sangrain-Kyadeh**.—This occurs in the month of *Tagoo-la*, (April,) at the commencement of the new year, and during this season, the games of *Reh-loundee*, and *Léh-prinedee* are held. The former very much resembles what is observed in our own country on New-year's-day. The women throw water over the men, who generally return the compliment ; no distinction is paid to rank. The water is thrown indiscriminately, and with an unsparing hand, upon high and low, and all seem determined to enjoy a season that permits of such unlimited freedom. The *Léh-prinedee* is the boat-race, which is held at the same time : a number of boats assemble in a broad creek, and start for a certain place, each striving to outstrip the other. The boats are impelled with oars, and those that are light and well manned, have a surprising speed upon the water. The shouts of the rowers, the strains of wild music, and the gay appearance of the boats

* The whole of these festivals owe their source to some fabulous narrative, preserved in the sacred writings or other books, and religiously believed by an ignorant and superstitious people. I regret that I am, from my very imperfect acquaintance with the language of this country, debarred an opportunity of transcribing any part of these.

decked out at the stem with branches of plantain trees and garlands of flowers, give a most pleasing and striking effect to the scene. Returned to the place from whence they started, a donation in money, or a piece of silk, is generally presented to the winner by the master of the ceremonies. Nautches and entertainments succeed the boat-race, and the festivities are closed with offerings to the priests and the *Rautoo**, who is on this occasion carefully washed and adorned.

2. *Oobho-chounde.*—This festival is held in the months *Wajho*, (July,) *Wagoung*, (August,) *Tantha-leng*, (September,) and *Sadyne-Kyot*, (October.) The people fast for a few days in each month, and proceeding to the Kioums†, dressed in their smartest attire, prostrate themselves before the Phraa‡, and make suitable offerings to the priests.

3. *Wingbauh-pôe* occurs in the month *Sadyne-Kyot*, (October.)—By way of celebrating this festival, a labyrinth is constructed by means of bamboo fences, so placed, as to make the path very narrow and intricate from the numerous turns it takes. People of both sexes, and of all ages, flock to this place in the evening, dressed in their smartest clothes; old as well as young thread the labyrinth, enjoying the fun that is occasioned by their several mistakes in endeavouring to get out of it. A temple is erected in the centre of the labyrinth, and within it are four images of the Buddha saint, to which the passengers severally make obeisance, placing small lamps upon different parts of the building for the purpose of illumination. The evening of each day generally closes with a display of fire-works, and the *Bouthsêy*, a ludicrous dramatic representation, very much resembling the *Putlé* of India. In addition to the above, a ceremony, termed the *Puddéysah*, is performed during the month of *Sadyne-Kyot*. This consists in the construction of a frame-work, intended to represent a tree, which is carried about upon the shoulders of the people, and upon it are hung such bequests as are made by individuals, in the shape of cloth, silks, dishes, &c. the whole of which are intended for the use of the inmates of the *Kioums*. Much is collected in this manner, it being considered highly meritorious to make even the smallest gift on this occasion. The procession is generally accompanied by dancers and musicians, whose services are wholly gratuitous; for whatever they may individually collect, is, in like manner, devoted to the necessities of the *Kioum*.

4. The *Ruttah-bôeh* is held in the month of *Taboo-dwar*, (February,) when the cold weather is supposed to have ended. A small tree is placed upon a car that had been constructed for the purpose, and to each end of this vehicle ropes are attached. The people assemble at the place from all quarters, and two parties (generally selected from

* Image of Gautama. † Monasteries. ‡ Gautama.

the inhabitants of two neighbouring villages) are formed for a trial of strength : one party pulling against the other. The successful party is allowed to draw the car away to their own village, where it is finally consumed.

Several other wrestling matches were made, until it became too dark to prolong the game. I now returned to the village, and entering my host's house, found a supper waiting my arrival. It was laughable to observe the curiosity of the villagers to see an *Inglee* at *the feeding hour*. Men, women, and children mounted the *michaun*, to the very great hazard of its coming down. There was in the appearance of my visitors nothing of that fear and abject submission so characteristic of the natives of India. The women, as well as the men, stood gazing upon me, and all joined in the laugh excited by the European mode of handing the food to my mouth, to them so incomprehensible and ridiculous. The children were not afraid to approach, and I was not so uncivil as to refuse them a share of the viands they apparently coveted. It was received with pleasure, and offered in return to their parents. A mother had a very pretty infant at her breast, and I was surprised to see her give it a piece of bread that had been previously chewed. I found on inquiry that a child is fed with a mouthful of boiled rice, reduced to a state of mucilage, on the second day of its birth. This it is said conduces to its vigour, and hastens the period for its final separation from the breast.

January 13th.—The sun had not risen before I was seated on my elephant, and setting out on my journey to *Ladong*. Leaving *Kyouprath*, and proceeding towards *Kaeng*, the route at first lay along the sea-beach, and afterwards over a rugged piece of ground, covered with blocks of sandstone and a conglomerate, which appear to have been borne down from the superincumbent hills, by the violence of the waters on their escape to the ocean. These rocks very much impeded my progress, rendering the motions of the elephant rough and tedious to an uncomfortable degree. At the further extremity of the plain, and bordering upon the sea-shore, the remains of a few mud volcanoes may be seen. They have the appearance of extensive mounds, covered with green sward, and (as is invariably the case with all the mud volcanoes in Arracan) have a few Jhow trees growing upon their sides. Proceeding to the spot for the purpose of examination, I could perceive no further evidences of present activity than what was indicated by the existence of a spring of muddy water on the summit of each volcano ; the water rising in bubbles, if at all disturbed, owing to the quantity of carbonic acid gas it contained. The mud was of a grey colour, and impregnated with much calcareous matter.

Emerging from the plain, the traveller may either proceed to *Kaeng* through the interior, viâ *Maen-grah* and *Moreng*, or take the direction of the sea-beach. In either case, the features of the country are much alike; sandstone is still the prevailing rock, and in some instances, when the upper stratum of clay has been washed away, it assumes the substance of an entire hill.

Leaving *Maen-grah* by a narrow path, almost concealed from view by the heavy jungle protruding on each side, I observed a bird that answers in description to the *Buceros Homrai* of Nipal. Indeed, it so closely resembles a drawing of the Buceros published in Part 1, Vol. xviii. Asiatic Researches, that I cannot for a moment doubt its identity with that bird. I shot one of the many that were hopping about the branches, making a disagreeable noise; their flight was heavy and awkward, owing apparently to the shortness of their wings: opening the stomach, I found it filled with berries resembling those of the *Peepul* and *Burgh'hut* trees; this would seem still further to establish the opinion advanced by Mr. Hodgson, that the *Buceros Homrai* was not a carnivorous bird. Passing through the large village of *Moreng*, the road to *Kaeng* lay over an extensive plain, covered with clumps of trees, the most conspicuous among which were the *Girjan*, *Tilsah*, and wild *Peepul*. Large flocks of the mountain minah were passing over-head, giving the clear chearful chirrup peculiar to these charming birds; and I observed a species of jay that was new to me. It was of an inferior size to the common Indian jay (*Neel-kaunt*), and of a different colour; but from its shape, flight, and general appearance, there was no mistaking its genus. The plumage of the head, back, and wings was of a pea-green colour; the under part of the belly and tail, of a lighter green, and the legs and bill, yellow. *Kaeng* is prettily situated upon high ground, not far removed from the sea, and at the mouth of a creek, which separates it from the district of *Ladong*, surrounded by extensive plains, clear of low jungle, and diversified with rice-fields, gardens and plots of indigo sowings. This village is superior to any one that I have seen on the island, both with respect to situation, and the general appearance of neatness and comfort that prevails throughout the place. Approaching *Kaeng* by the sea shore (in preference to the route above described), the remains of several mud volcanoes may be seen upon the hills to the left. The undulating appearance of these mounds, covered throughout with a beautiful green sward, and studded with a few *Jhow* trees, has a striking and agreeable effect amidst so much jungle and similarity of aspect otherwise common to these hills.

At the foot of the volcano, adjoining the sea-beach, I perceived several boulders of a rock, resembling *clink-stone;* it was very hard and sonorous when struck with the hammer, of a sea-green colour, and intersected with veins of calc-spar; it was not improbable that it had been at one time ejected from these volcanoes in a state of igneous fusion, along with other substances.

Crossing the *Kaeng creek*, I entered a district of *Ladong;* extensive plains devoted to the cultivation of rice, and only separated from each other by the narrow strips of *Girjun* trees and underwood, mark the fertility of this part of *Rambree;* the soil is so exceedingly fruitful that the principal exportations of rice from the island are derived from *Ladong*. There are many Petroleum wells in this district, some of which yield a very fair supply of oil. The whole of the wells known to exist in the islands of Rambree and Cheduba are farmed by Government, and sold annually to the highest bidder; I conceive it would be (in the end) far more advantageous to Government was the sale to take place *every three years*, instead of *annually:* was more labour bestowed upon these wells, the produce would be greater; but the present system deters a purchaser from devoting his labour to the production of an article that may become the property of a more successful candidate, before he shall have received any return for the capital he had already invested in them. The wells were sold this year for 120 rupees. I am told that six only of the *Ladong* wells are worked. One well is said to yield as much as three quart bottles of oil (or $2\frac{1}{4}$ seers) per diem, and allowing that the remaining five are nearly as productive, the quantity of oil collected during a season (from the 1st November to the 1st June), would amount to as much as 70 *maunds*.

The oil is sold in *Ladong* at the rate of one-half tillia per rupee. The weight of a *tillia* varies from nine to sixteen seers. The *Ladong tillia* of oil is said to be as much as can be contained in 18 bottles or $13\frac{1}{2}$ seers. The oil is much used, especially for burning; it burns long, and gives a fine clear flame; it has, however, a very disagreeable smell, and is so highly inflammable, that it must be used with caution.

The oil produced on the Island of *Cheduba* is not so abundant or so pure as that of *Rambree*. One of the Petroleum wells in *Ladong* is said to exist on the site of a dormant mud volcano—a circumstance not at all improbable, when it is considered, that the gases and imflammable substances forming the constituent parts of either, are, as far as has been hitherto discovered, essentially alike. The soil thrown up from these wells is highly bituminous, and in some instances abounds with very beautiful crystals of iron pyrites.

I had made up my mind to put up at the *thanna* of Ladong, so took the nearest direction to it. Tne path lay at the foot of a range of sandstone hills, to the left of the plains; on the summit of this range stood a temple dedicated to Gautama, and in front of it the long pole usually erected near such places of worship. The character of the rock was such as had been hitherto observed, with this exception, that a few rolled pieces of *chert* and *stalactites* were visible in a few places, strewed upon the surface. I was fortunate enough to shoot a very beautiful species of green pigeon in these hills: it was as large as the wood-pigeon of Europe, and had a superb plumage; the colour of the head, back, and tail were of a very dark-green, while the wings and belly presented a bright azure colour.

I had not proceeded far on my way towards the *thanna*, when my attention was roused by the sound of music and the report of fire-arms. Entering upon the plain, I perceived a multitude of people apparently met on some extraordinary occasion. I drew near, and learned that they had assembled to perform the funeral rite of a *Phoongree*, who had lately died. These high priests of Buddha denominated *Phoongrees*, are common in Arracan, and much revered by the laity; they are never known to interfere in the domestic affairs of the people, or exercise that spiritual dominion so generally usurped by the ambitious priesthood of other countries. Confining themselves entirely to the exercise of their religious duties, they are seldom seen beyond the precincts of the *Kioum;* unless it be to make their morning rounds through the neighbouring villages, accompanied by the boys, to whose keeping are committed the voluntary contributions of the inhabitants. It is worthy of remark that these daily excursions are made not so much for the purpose of obtaining supplies for the inmates of the monastery, as to gratify the wishes of the villagers, who are desirous of enjoying this opportunity of testifying their respect and attachment for the ministers of their religion. The discipline of the *Phoongrees* is extremely rigid, and not unlike that preserved in the monastic sects of Europe. To a life of celibacy is added the injunction of not holding any communion whatever with the female sex; and so strictly is this precept adhered to, that a *Phoongree* will neither converse with a female, or receive from her hands the offering she may wish to present to him. The dress of the *Phoongree* is confined to an orange-coloured mantle, which extends from the shoulders to some little distance below the knee; his head is closely shaved, and always uncovered. He sleeps in the *Kioum*, upon a mat, with no other covering than that afforded by his mantle; and his diet is of the simplest kind, one

meal a day being considered sufficient for his subsistence. The food is cooked by some of the scholars of the *Kioum*, or by the newly initiated of the sect; and those *Phoongrees* who are desirous of maintaining a character for peculiar abstinence, will not even express a desire to satisfy the claims of hunger, however pressing they may be; waiting patiently until such time as food may be presented to them by some inmate of the *Kioum*: with these are many other observances, all enjoining an uninterrupted course of humiliation and abstinence.

Some of these monasteries are very large, and contain a great many monks, as well as the boys whose education they superintend. They are erected by the villagers, and supply such accommodation as is required. In a remote part of the interior of the *Kioum* is an image of *Gautama*. Before this image the Phoongrees prostrate themselves twice a day, and never leave the building without making an obeisance, and intimating their intention to the *Routoo*: a similar duty is performed on their return. This image is composed of more or less costly materials, according to circumstances. In some *Kioums* I have seen the *Phraa* entirely covered with gold or silver leaf; in others again, it is of wood or stone, with little or no ornament whatever. Flowers, rice, and parched grain are the offerings generally made at the shrine of *Gautama*, either by officiating priests, or any of the laity, as a religious observance, and for the attainment of some particular object of desire.

The assumption of the monastic garb is voluntary; the person who expresses a wish to become a *Phoongree* is admitted into the convent (without regard to country, or the religion he may formerly have professed), provided he stipulates his readiness to conform to the Buddhist observances in matters of faith and discipline, and there exists no impediment (such as his having a family to support, or his not having obtained the permission of his parents, &c.), to his abandonment of earthly pursuits; sickness, deformity, and a bad character are also sufficient causes for rejection. Should none of these obstacles present themselves, the candidate is admitted into the *Kioum*, and attired in the prescribed dress, enters upon the duties of a *Phoongree*. If, as is generally the case, his age shall not have exceeded 15 years, he is appointed to the performance of the menial duties, and gradually initiated in the peculiar tenets of the sect, until he shall have arrived at the age of 20 years, the time appointed for confirmation.

It is not uncommon for a *Phoongree* to devote only a certain period of his life to the duties of the convent, returning to the world so soon as that term of religious abstinence shall have expired. These *Phoongrees* are generally young men, who are desirous of assuming the monastic garb, either from a religious feeling, or for the purpose of performing

some expiatory service, and are enabled to do so through the assistance of some persons who deem it an act of piety to defray the expences consequent to their ordination.

In towns and large villages the education of the children* (the male part of them), is chiefly entrusted to the *Phoongrees*, and it is a part of their daily and uninterrupted occupation. No distinction is made between the children of the rich and the poor: both are treated alike and receive a similar education; no remuneration whatever being made to these good monks for their trouble, save the daily provision that is voluntarily supplied by the native community for their subsistence. Children under nine pears of age are not admissible into the *Kioum*, being of too tender an age to undergo the discipline and duties imposed upon them out of school hours, such as fetching wood and water, cleaning the rice, and attending the priests in their daily rounds, for it is the duty of the boys to carry the baskets containing the contributions of food. Such children as are parentless, or of poor parents, and even those who reside at some distance from the *Kioum*, are fed as well as lodged by the priests. The other boys are allowed a certain time to go home to their meals, but they are obliged to sleep in the convent, for what they have read during the day is repeated in the evening or at day-break on the following morning.

There is another source of education equally peculiar to the Mughs; such as are not engaged in any pursuit or employment requiring all their time, devote a portion of it to the education of children, entirely gratis; less labour being expected from the children than is imposed upon them in the *Kioums*. Children under nine years of age and of both sexes are admissable to such schools, the rules, as before observed, being less strict than those enforced at the monasteries; it is therefore not uncommon to meet with children of a very tender age at such schools.

I know nothing so gratifying to a stranger as a visit to the larger *Kioums* in the evening of a fine day. To observe boys of all ages rushing from the scene of their daily labours to the tank or other place of enjoyment, with that cheerful demeanour which marks the school-boy in our own country when released from his task and joining his fellows on the play-ground. At this time a group of monks may be seen standing on the elevated *Michaun* at the threshold of the *Kioum*, enjoying the evening air, or quietly watching the conduct of

* I am indebted to my friend Captain WILLIAMS for much information on this subject, as well as on other matters connected with this singular people. The great popularity he enjoys with the Mughs, has given him favourable opportunities for prosecuting his inquiries into their customs, &c.

the little urchins just escaped from their controul. To the eye of the most careful observer, their countenances bespeak a tranquillity of mind unknown to such whose passions are yet unsubdued. There is in the appearance of these priests an equal absence of puritanical zeal or overweening confidence; their features are as placid as the sky above them, and even with those whose religious duties are of the graver cast, a smile of benevolence may be seen to break through the shades of sorrow and self-degradation. Often have I, in passing, addressed these monks, and have invariably received a courteous reply. On some occasions I have found a welcome in the *Kioum* when shelter was denied me elsewhere; and with that welcome the more substantial evidences of good-will in the shape of a repast prepared for myself and followers. I never left the *Kioum* in prosecution of my journey without feeling grateful to those good monks, who had so charitably received the *white stranger* into their mansion.

The *Bhi Kuni* (nuns), are equally common with the priests. They either reside in a convent of nuns, or live separately in some house constructed near a *Koo* (temple), superintending the offerings, and leading a life of religious abstinence. The greater part of the *Bhi Kuni*, have retained their virginity from early youth; others again have retired from the scene of earthly cares at a more advanced age; in some instances, after marriage, but only when that marriage has not been productive of children. The dress of the *Bhi kuni* is similar to that of the *Phoongrees*, and their discipline in every other respect alike. Both are equally revered by the laity, and supplied with the little food necessary for their subsistence.

Respected by the people when living, it is not surprising that the *Nigh-ban** of a *Phoongree* should be marked by circumstances expressive of the sanctity of his character, and the attachment of his flock. The nature of the preparations made to do honour to his remains will depend much upon the means of the population residing in the neighbourhood of the *Kioum*. If these should be ample, the funeral obsequies will be performed on a scale of magnificence seldom surpassed in their most expensive shews; but if otherwise, the ceremonies will of necessity be got over in a hurried and economical style. The following will however be found to be the general practice with regard to the obsequies of a deceased *Phoongree*, and such mode of performing them was adopted in the present instance.

When emancipated from the world, the body is opened and embalmed; after which it lies for many weeks exposed to public view. The body is then confined in a coffin richly embellished with gold and

* *Nirvân*, death; properly *emancipation*.

silver leaf, and this is placed upon a lofty car that had been constructed for the purpose. The inhabitants of the neighbouring villages flock to the spot, and ropes having been fixed to the fore and hinder parts of the car, a contention arises among the villagers for the remains of the *Phoongree*. One party pulls against the other, and those that are successful claim the honor of finishing the ceremonies. This is done by a grand display of fireworks, the greater part of which are skilfully directed at the car, which is at length set on fire and the body is consumed*. Should the deceased *Phoongree* have maintained a character for peculiar sanctity, a part of his remains is not unfrequently preserved from the flames and retained as valuable relics. The influence of superstition has attached much value to such remains, and in addition to the worth they may be supposed to possess from the religious character of the departed priest, they are held by the more ignorant to be a common ingredient in those charms that are in use with the wizard.

The Mughs hold the practice of burning the dead to be more honourable than that of committing the body to the earth or the sea, probably from its being attended with greater expense and publicity. Funerals are, however, conducted in either way, according to the means of the relations, or other circumstances favouring the adoption of one particular practice. The spot on which a funeral pile had been raised is not unfrequently marked by a cenotaph, a garden, a clump of trees, or such other monument of affection as the condition of the parties will enable them to place over the ashes of a departed relative. In some cases, the funeral rites are followed with donations of food and clothing to the priests, and a further evidence of piety is evinced in the adoption of some young man who shall express his readiness to embrace the profession of a *Phoongree*.

January 14.—I had slept at the thannah on the night of the 13th, and was up at an early hour on the following morning with the intention of moving on to *Oogah*. The distance from *Khyouk Phyoo* to *Kyouprath* is at least sixteen miles; from that to *Ladong* is said to be as much as twenty; so that I had travelled 36 miles in the two days. *Oogah* was distant 12 miles from *Ladong*, and as the route lay over a level country I was not detained very long upon the road. The villages in *Ladong* are remarkably large, and have a cheerful, comfortable appearance. The whole face of the district, with the exception of the narrow belts of *Girjun* trees and underwood before mentioned, is under cultivation; and but for the costume and features of the inhabitants as well as the peculiar construction of the houses, I could have fancied

* See a full account of the same ceremony by the late Rev. Dr. Carey, As. Res. xii. 389.—Ed.

myself in Bengal. The general appearance of the *Mugh*, induces the supposition that his condition is not only infinitely superior to that of the poorer classes in many parts of India, but that he is comparatively happy and contented with his lot. His clothing, though coarse and of native manufacture, is ample for the climate, and his vigorous frame of body bespeaks a sufficiency of nourishment. As his wants are few and easily supplied, there is no call for that unremitting labour which secures to the poor of other countries their scanty sustenance. The earnings of one day of toil generally provide for the exigencies of two successive days of ease; and to such as are, from a more indolent habit, less willing to cultivate the soil or perform the duties of an hireling, the forest and the sea present an inexhaustible supply of food. It is to this abundance of the necessaries of life in some one shape or another that we may ascribe the existence of that apathetic indifference to the future, characteristic of the Mugh population, and until some *artificial wants* are produced by a taste for luxuries hitherto unknown, we shall look in vain for that display of activity and toil peculiar to a more civilized, but less happy and probably less virtuous, race of people. It is not however too much to affirm, that such a change is already perceptible among those who are most in contact with Europeans and the natives of India.

In the towns of *Khyouk Phyoo* and *Rambree*, we may observe this indication of the growing taste for articles of foreign manufacture, in the small investments of cutlery, glass-ware, muslins, and broad-cloth exposed for sale in the shops along with the produce of the country. The people have already become smarter in their dresses, and were a little more attention paid to their pattern of piece goods, I have no doubt but the sale of these would be far greater than it is at present. Long habituated to a state of being little remote from that enjoyed by the brutes of the forest, the present generation are prepared to value those little luxuries denied to them during the reign of Burmah despotism, and will not be slow in securing the possession of them if placed within their reach. It is amusing, though melancholy, to hear these poor people relate the state of things in former days, in as far as regards the importation of foreign produce, and the prohibitions that debarred them the privilege of wearing the muslin turban or angah, even were they sufficiently wealthy to purchase the materials for one. As any exportation of the staple produce of the soil was seldom or ever permitted, few returns were made in the shape of Europe or Indian goods. They did, on some occasions, find their way into the country by the *Godoohs* that returned from Calcutta and Chittagong, laden with such articles of Europe or Indian manufacture, as the owners were enabled to obtain in exchange for the gold leaf, deer horns, bees' wax,

and earth oil, the produce of Ava and Arracan. The demands of the Burmah *Kaeng**, and the numerous exactions, with the expenses of a long and dangerous voyage, were, however, thrown with such severe but necessary weight upon the original prices of the several commodities imported, that none but the rulers of the land would venture to evince a disposition to become possessed of them.

Property has now become comparatively secure; a stimulus has been given to industry by the freedom allowed to the exportation of produce; with an increase of production there will be an augmentation of capital, and the agriculturist may look forward to the attainment of those articles of comfort and luxury hitherto denied to him. Still this change for the better will, of necessity, be very gradual. It is as it were a newly discovered land, and as such it will require the united efforts of capital and labour (joined with skill), to bring its resources into play. As is well known, the staple produce of the soil is *rice*. Great quantities of this grain are annually exported to Madras and Penang: the returns being generally made in kind, and consisting chiefly of Madras cloths and Europe muslins, which are either sold in Arracan or retained for importation into Ava. I am not aware that any other article of agricultural produce is exported from *Rambree*. Both cotton and indigo are, however, grown upon the island, the former on the mountain side after it had been cleared of the jungle; tobacco is also produced in the ravines and clefts of the hills, subsequent to the accumulation of alluvial soil deposited therein by means of a dam so constructed, as to oppose its escape with the torrent. But neither of these are produced in such abundance as to permit of a large exportation; the quantity grown being little more than sufficient for consumption in the province. A want of capital, and perhaps a want of confidence in the Government, prohibiting agricultural speculation, the production is generally confined to what may be deemed sufficient for domestic purposes, or be grown with the sure prospect of ultimate reward.

The morning was bitterly cold, and I was glad to dismount from the elephant and walk. Snipe were very numerous on a piece of marshy ground, through which the road lay, and further on, I observed two deer of the same species as the *Ratwa deer* of Nipal; I could not give a better description of this animal than referring my readers to the account given of it by Mr. Hodgson along with the drawing, both of which appear in Part 2, vol. xviii. Asiatic Researches. I had before seen one that had been caught in a net, and brought unto me. The

* Collectors of customs. The duty levied was usually as much as ten per cent. and not unfrequently paid in kind.

Mughs call the animal *Ghi*, and say, that they are very abundant upon the island, residing in the recesses of the forest. The two deer above-mentioned were seen at the skirts of the jungle, and were evidently returning to their haunts after a night's ramble through the plains.

There was nothing peculiar in the geological features of the country between *Ladong* and *Oogah*. The soil was, as usual, composed of a rich clay, mixed with a small proportion of sand, and sandstone the prevailing rock. The dip of the stratum, wherever a stratification could be observed, being still to the S. S. W. and S. W. parallel to the bearing of the hills.

Leaving the stubble fields of *Ladong*, I came once more upon the beach, and could see the village of *Oogah* beyond me, very prettily situated on a bight of the sea. It was surrounded with tamarind and mango trees, and was on the whole a neat and comfortable looking village. The prospect from *Oogah* was remarkably fine; beyond it, on the land side, lay *Jeeka*, the highest mountain in the island, and immediately opposite to it, separated only by a small channel of the sea, was the island of *Cheduba*, with its blue hills and undulating plains. A *Godoo* was at anchor between the islands, and from the reports of the crew who were on shore for water, it appeared that she had come last from *Chittagong*, and was bound to *Bassem*, laden with betel-nuts and sundries. The *Soogree** of the village had come out to escort me to his house, a snug looking building surrounded with a strong bamboo fence. In front of the house, and under the tamarind trees, a nice *michaun* had been constructed for the accommodation of travellers, and upon this I lay down and slept until a room with a mat, &c., should be got ready in the *Soogree's* house for my reception at night. I should have been very well pleased to have slept out in the open air upon the *michaun*, but for the remonstrances of my host, who pointed out the danger of doing so in a place so much infested with tigers. It was perhaps as well that I did not sleep outside, for a tiger came into the village during the night, and so much alarmed one of the elephants that he broke loose. The old *Soogree* appeared to be in very good circumstances; he had a large house, abundance of poultry and cattle, and in addition to these evidences of prosperity, he had two wives. Polygamy is common enough in Arracan. There appears to be no limitation; a man may keep as many wives as he can afford to maintain. The consent of the first wife should, however, be obtained previous to the conclusion of a second contract. It is seldom that a refusal is given, and equally seldom that attention is paid to it. Retaining the privileges of a mistress, and probably aware of her

* The head man of the circle; he collects the revenue.

inability to enforce a compliance with the restriction she wishes to impose, the elder wife usually signifies her readiness to receive into the family a second helpmate for her husband. This new alliance is seldom resorted to before the first wife shall have ceased to retain the charms of her youth, and have become incapable of performing the several domestic duties incumbent upon her.

The system of betrothing children to each other at a very early age, so common with natives of India, does not obtain with the Arracanese. Instances will occur when their marriage has been the result of a preconcerted arrangement on the part of the parents so soon as the female shall have attained the age of maturity (15 years), and not preceded by mutual attachment of the parties united. The young people are not, however, unfrequently, permitted to form their own choice, and where no great disparity of age exists, the consent of the parents is generally obtained. As there is no seclusion of the females there can be no want of opportunity for the display of those little attentions, which in the eyes of the female sex distinguish a lover from a mere observer. The lifting of a pitcher from the well or tank to his mistress's head, or the present of a bouquet of early flowers to adorn her hair, are but few of the many ways by which the passion of her lover is exemplified. Should such attention be pleasing to the fair one, she will probably intimate as much by the gift of a neatly made bundle of *cheroots* manufactured by her own hand. The attachment between the parties being known to their parents and their consent obtained, the astrologer (*Hoora-dye*), is consulted: the day, month and year of their children's birth is made known to him, and if the result of his calculations are favourable to the union, every thing is arranged for its completion. In the first place, a present of a fine silk dress; some gold and silver ornaments, with a little tea mixed up with spices, are sent to the young lady by her lover, who will perhaps follow in the evening of the same day preceded by the young unmarried men of the village: these advancing before him as he approaches the house of his intended bride, extend to the right and left, and oppose his further progress until he has satisfied them with as many rupees as he can afford to lose. He now draws near to the threshold of his mistress's house. She, on her part, is attended by the young maidens of the village, and these oppose his entrance to the dwelling until he has paid a fine similar to that imposed upon him by his male companions. The lover now enters the house; and seated at his mistress's side, flowers and water are scattered over both by the hands of the oldest and most respectable person present.

This done, they both sit down to a meal prepared by the parents of the girl, receiving the food from each other's hands. The meal ended,

the hands of the bride and bridegroom are laid upon each other, (the hand of the bridegroom uppermost,) and washed by the same person who had sprinkled the water and flowers over the parties. The father of the bridegroom then takes a ring from off his son's hand, and places it upon the third finger of the bride's left hand. The marriage ceremony being now completed, a *nantoh* and entertainment is held at the bride's house. The bridegroom retires with the bride, and remains seven days in her parent's house, preparatory to his taking her to his own home. This will be found to be the general practice of the people on the occasion of their nuptials, but it is not uncommon for a man to take to himself a wife without going through any part whatever of the ceremony above described, nor is there any discredit attached to the parties so united. The woman is viewed in the light of a wife, and treated, in every respect, in the same manner as if she had been united to the man in the manner I have detailed. A *prostitute* was a being unknown to the *Mughs* before the country had fallen into the hands of the British. Among the blessings attending the change of rule and marking the progress of *civilization* in Arracan, is the introduction of a gradual increase of that unhappy class of people, and with it the miseries that are consequent to an unrestrained and promiscuous intercourse. To the honour of the *Mugh* women I must declare, that instances of prostitution on their part are still of rare occurrence; the reputation for this vice is still more generally attached to their *more civilized* neighbours the *Bengalees*.

So much liberty being allowed to the sexes in early youth, it may be supposed that an unlicensed intercourse will, in many instances, be found to exist between them previous to their union. It would be unreasonable to affirm that a passion which is so often known to break through the bounds imposed by religion and morality upon a people who claim for themselves a superior degree of civilization, should not in this country be known to exist in an equally unbridled state, and produce the evils consequent to an unrestrained intercourse and the shame of an avowal. Instances of abortion or bastardy are not, however, of frequent occurrence, the good sense of the parents, to whom the attachment in its several stages is generally known, preventing by a timely union of the parties, the evil which must originate from an intercourse unsanctioned by custom and authority.

When it is considered how easily a divorce is obtained, and how seldom sought for, we may naturally conclude that marriage is conducive to the happiness of the people. Separation may be effected (privately) by a deed drawn out by husband and wife, and witnessed by two or more respectable neighbours; or both parties may appear before the

meeo-woon or magistrate, and a separation is instantaneously effected on their compliance with the rules laid down for observance in such cases. If the wife objects to remain any longer with her husband, and he shall be found to have repeatedly ill treated her, she is at liberty to depart, receiving from him the whole of her property, as well as the children (both male and female), that may have been born to her. The children are, in maturer years, allowed to reside with either parent as choice directs. If, on the contrary, the wife shall be found to have behaved ill, she pays a certain sum of money (generally about 25 or 30 rupees), to her husband, who also retains possession of the male children; the wife receiving no part whatever of the property. In cases where no criminality is attached to either party, and both desire to be separated, a fair division of property is made, each receiving what he or she may have possessed before marriage, with an equal share of the produce of their united labours; the husband retaining the boys, and the wife the girls. The case being investigated and decided upon, a *pawn* is broken into two pieces, one of which is given to each as the emblem of separation. This done, the divorce has been effected, and they are both at liberty to contract any new alliance.

[*To be continued.*]

III.—*Description of the (so called) Mountain Trout of Kemaon. By Dr.* J. M'Clelland, *Assistant Surgeon, 30th Regt. N. I.*

From among the treasures of natural history of Kemaon that have not hitherto been indicated, the following notice of a new species of fish, which affords a plentiful article of food to those who reside in the vicinity of small rocky streams, may not be uninteresting. From the appearance of this species, it has commonly been considered by Europeans to whom it is familiar as a common mountain trout; a closer examination however, soon detects the mistake, and except that it belongs to the class of abdominal fishes and inhabits fresh-water streams, there is no natural connexion between this fish and the species to which it was supposed to belong. The following are its distinguishing characters.

Body compressed; mouth situated under the head, lunate, retractile, toothless. Dorsal fin consisting of eight rays. Two ventral fins situated on the centre of the abdomen, caudal fin bifid.

The colour of the back is bluish-black, diminishing in intensity on the sides, which are each marked as usual with a lateral line, and the belly is pale bluish-white. The scales are so small as to be scarcely perceptible, and there is a slight golden lustre or iridescence about the head; the length is from three inches to nine.

The habits of this fish are so peculiar as to deserve to be mentioned. It derives its food from the green slime or moss that collects on the surface of rocks under water, and which is removed with considerable difficulty with the finger; but so well has nature provided the creature with the means of procuring its peculiar sustenance, that the object is fulfilled with ease and apparent enjoyment. When feeding on the upper surface of a stone, the animal glides forward with sufficient force, and at the same time depresses the under lip, with which it scrapes the slime off the rock as it passes over it, leaving a streak behind like the scratch of a stick. If the food is to be derived from the side of a rock, the creature accommodates itself accordingly; and if from the under surface of a projecting ledge, it throws itself on its back and darts forward with the most wonderful agility.

From observing these peculiarities of character it became necessary to examine the anatomical structure of the mouth and digestive organs of the animal, and the following is the result.

The under jaw or rather the under lip (for it cannot be said to have any jaws, and in this respect it resembles the sturgeon and loricaria), is composed of three small bones, the two outer are articulated at their bases to the inferior angles of the ossa malarum or cheek bones, (*a* fig. 3. Pl. I.)and the centre one is in like manner attached to the sternum (*b*), these bones (1, 2, 3,) have hinge joints by which the lip may be depressed at its free extremity, and they are attached laterally to each other by strong ligaments.

On the inner side of the bones of the lip is situated a strong muscular mass (*a* fig. 4,) whose fibres originate on the inner side of the sternum, and are inserted into the upper extremities of the bones and ligaments of the lip, while that part of the organ which is used for collecting food in the manner above described, is at once protected and adapted to the performance of its singular function by a thick cartilaginous covering. Whether we contemplate the peculiar figure of the ossa malarum, the sternum, or of the muscles, nothing can be more simple or complete than the means resorted to by Providence in adapting the lip of this creature to the peculiar office it is destined to perform.

From the unyielding nature of the abutments to which the lip is attached in order to enable it to resist the pressure it is exposed to, as well as from the peculiar nature of the joint, it is incapable of any other action than that of being depressed; but owing to its great strength and necessary thickness, this motion alone would not be enough to open the mouth sufficiently for the admission of food, and this brings us to another contrivance still more curious.

There is a small bone (*c* fig. 3.) loosely attached to what may be named the nasal process of the frontal bone, by a hinge joint which

Fig. 1.

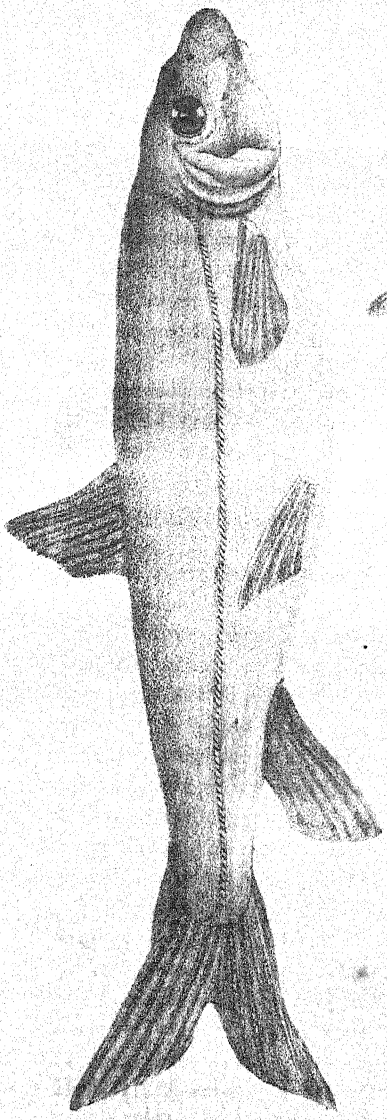


Fig. 2.

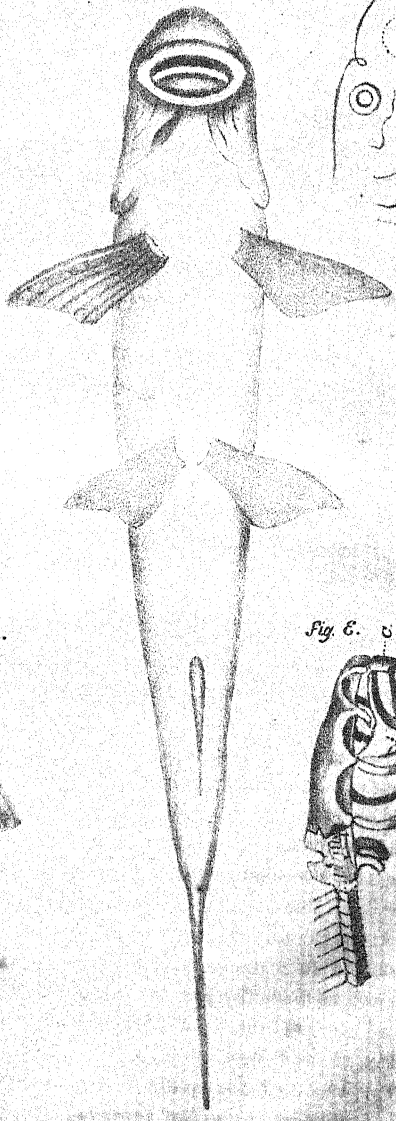


Fig. 4

Fig. 5.

enables it to swing freely backwards and forwards, and to the lower end of this there is fixed a cartilaginous rim which forms the anterior boundary of the mouth (*d*), and by the muscular structure of the snout and palate the anterior boundary of the mouth is drawn forward or retracted at pleasure. It is probable from the consideration of these parts that they do not serve merely for opening the mouth, but also assist in collecting or sucking food into it, by means of the vacuum consequent on the enlargement of its cavity, the opercula being compressed on the apertura branchialis.

From the soft pulpy nature of the food mastication would be useless, accordingly there are no teeth: the tongue is short and cartilaginous. The last remarkable circumstance in the anatomy of this fish which I shall mention is, the great length of the intestinal canal, it being eight times that of the body, the stomach alone extending the whole length of the abdominal cavity. These circumstances indicate either the innutritious nature of the food, or the strong digestive powers that are requisite: the latter would appear to be the case from the muscular strength of the stomach, which is displayed to the naked eye by the numerous white bands of longitudinal fibres which may be observed passing thus in a zigzag form from one extremity to the other.

The whole length of the canal was loaded in the specimen examined with the peculiar slimy food already mentioned.

During the warm season these fish are seen sporting and feeding at all hours, but in winter they spend their time chiefly under rocks and stones, where they probably deposit their spawn, only coming out to feed as the sun ascends in the meridian, and again retiring in the afternoon; or on being frightened, they rush into their hiding places, from which they can easily be taken with the hand, and in this way the native fisherman in a few minutes secures as many of them as he wishes. Conceiving them to be trout every attempt has been made to catch them in the usual way with fly and bait, and though every device has been resorted to, instances of success are so rare that they may be almost referred to chance. A less refined but more successful method of fishing (as I have been assured by an intelligent friend who has seen it) is practised in the vicinity of Lohooghat by the blacksmiths during periods of relaxation from their more legitimate calling: these persons, aware of the disposition of the fish to spend certain seasons under stones, pursue the beds of the rivers, striking such loose stones with their sledge-hammers as they may suspect to conceal fish, which they thus kill by concussion.

IV.—*Discovery of the Genuine Tea Plant in Upper Assam.*

[The following official correspondence of the Tea Committee has been obligingly handed to us for publication. We hasten to present it to our readers in its original shape rather than attempt to make an abstract of its contents, because the curiosity of the public is much raised, and they will naturally wish to follow the whole train of the discovery, and give the credit thereof where it is due.—ED.]

Letter from the Committee of Tea Culture to W. H. MACNAGHTEN, *Esq. Secretary to the Government of India, in the Revenue Department.*

SIR,

We request that you will have the goodness to submit to the Right Honorable the Governor General of India in Council the enclosed copies of the reports, which we have received from Captain JENKINS, dated the 7th and 19th May, and from Lieut. CHARLTON, dated the 17th May; also a subsequent communication from Lieut. CHARLTON, dated the 5th of last month, together with the samples of the fruit and leaves of the tea plant of Upper Assam, which accompanied it, and some specimens of the leaves previously received.

2. It is with feelings of the highest possible satisfaction that we are enabled to announce to his Lordship in Council, that the tea shrub is beyond all doubt indigenous in Upper Assam, being found there through an extent of country of one month's march within the Honorable Company's territories, from Sadiya and Beesa, to the Chinese frontier province of Yunnan, where the shrub is cultivated for the sake of its leaf. We have no hesitation in declaring this discovery, which is due to the indefatigable researches of Capt. JENKINS and Lieut. CHARLTON, to be by far the most important and valuable that has ever been made in matters connected with the agricultural or commercial resources of this empire. We are perfectly confident that the tea plant which has been brought to light, will be found capable, under proper management, of being cultivated with complete success for commercial purposes, and that consequently the object of our labors may be before long fully realised.

3. It is proper to observe, that we were not altogether unprepared for this highly interesting event. We were acquainted with the fact that so far back as 1826, the late ingenious Mr. DAVID SCOTT, sent down from Munipore specimens of the leaves of a shrub, which he insisted upon was a real tea; and it will be seen from the enclosed reports from the agent to the Governor General on the north-eastern frontier and his assistant, that a similar assertion was strongly urged in regard to the existence of the tea in Upper Assam. Still we felt ourselves bound to suspend our decision on the subject until we should be in possession of the fruit of the reputed shrub, the only test which ought to guide us. We knew that several species of Camellia were

indigenous in our north-eastern frontier provinces; and taking into consideration the close affinity between the two genera, we were disposed to expect, that the alleged tea would prove nothing else but some sort of Camellia. We have at length obtained the fruit of the Sadiya plant from Lieut. CHARLTON, and we are now enabled to state with certainty, that not only is it a genuine tea, but that no doubt can be entertained of its being the identical tea of China, which is the exclusive source of all the varieties and shades of the tea of commerce. With the view of exhibiting the peculiarities in the structure of the fruit, on which depends entirely the difference between the Tea and Camellia, we have desired our officiating secretary to annex to this letter a sketch of the fruit of both, with explanatory remarks.

4. We beg leave most respectfully to submit the preceding facts to the particular consideration of Government, and earnestly to recommend, that in the first instance, and as early as may be practicable, one or more scientific gentlemen properly qualified for the investigation may be deputed into Upper Assam for the purpose of collecting on the spot the greatest variety procurable of botanical, geological and other details, which, as preliminary information, are absolutely necessary before ulterior measures can be successfully taken with regard to the cultivation of the tea shrub of that country. We also beg to express our opinion, that it would be highly desirable to adopt forthwith the plan suggested in Lieut. CHARLTON's last letter, of the 5th of November, of establishing a communication with Yunnam by means of a land-road, at least as far as Hookam, since, independent of all other advantages, it would materially facilitate the operations of the scientific deputation, which we have recommended should be sent to Upper Assam with as little delay as possible.

5. We anticipate that the execution of the recommendations we have made, need not be attended with any considerable expense; but it appears to us, with reference to the very great importance of the occasion, that the only consideration which should have weight is, that the money which may be required should be faithfully and economically applied to the purposes for which it may be granted.

We have, &c.

Calcutta, Dec. 24, 1834. Signed by the Committee of Tea Culture.

From Captain F. JENKINS, *Agent to the Governor General on the N. E. Frontier, to* G. J. GORDON, *Esq. Secretary of the Committee of Tea Culture, dated Gowahatty, 7th May,* 1834.

I regret the delay that has occurred in acknowledging your circular, dated the 3rd March, to my address: it has been occasioned by unavoidable circumstances which I have further to regret will prevent

my replying to your communication to the length I could wish or the subject deserves.

2. My little acquaintance with Assam will not admit of my replying to all your questions, but from general information and my own observation, I am so fully impressed with the belief of the fitness of the mountainous region which divides Cachár from Assam for the growth of tea, that I beg to attempt to call the attention of the Committee to that region in the most forcible manner I can, with a view to its examination by a competent individual.

3. The mountainous tract I allude to, commences from the east of the country of the Jynteah Raja, and continues always increasing in elevation until it reaches to the eastern end of the valley of Assam, and is so far under the controul of British authority, immediately between Cachar and Assam completely so, and farther on more or less directly or indirectly. The part entirely under us ranges from 6 to 8000 feet greatest heights, and farther east the mountains attain a height of 10,000 feet, and the valleys and beds of streams are from 2500 to 4000 feet above the sea. From the end of the valley of Assam this ceases to be merely a west and east range, its direct continuation passes into China into the tea countries of Sechuen and Yunnan: the northern bend in the latitude of Sadiya meets a branch of the snowy mountains, and the southern divides off into the two mountainous ranges, which border the Irrawady on either side, from its sources to the sea.

4. Every part of this mountainous country that I have visited, presents nearly a uniform geological structure, being almost entirely composed of clay-slate, and every where nearly of the same appearance, very much broken and disintegrated, so much so as to be seldom visible in mass, and being covered with a deep coat of soil and luxuriant vegetation even on the greatest heights.

5. Camellias are found in every part of this hill country, and within our jurisdiction in the Singpho district of Beesa, a coarse variety of the tea plant is, as I am informed, undoubtedly indigenous. A plant was given to me at Sadiya, which I have reason to suppose, was a genuiue tea tree, and I intended to have brought it to Calcutta for examination, but I received it in a sickly state, and from the prevalence of great heat I was unable to succeed in taking it to the presidency. I shall endeavour to procure another plant or two for the satisfaction of the Committee. However, having no doubt myself of the fact of the tea shrub being found wild in the eastern parts of Assam, I would beg to recommend the expediency of some well-qualified person being at once sent up for the identification of the plant beyond any objection, for the examination of the soil in which it grows as reported, and an inspection of the tract of mountains between Cachar and Assam.

6. If this recommendation were acted upon, the person deputed should be in Cachar by the 1st of November, and proceed immediately to ascend the mountains in communication with the officer in civil charge, Captain FISHER, who would previously have made arrangements for his being provided with porters, &c. He should pursue nearly the tract followed by me on the same journey, and on arrival at Bishonath should proceed by water to Sadiya, and thence go up to Beesa at the foot of the mountains dividing Assam from Ava.

7. As the individual thus deputed would of course be a competent botanist, and perhaps geologist, I contemplate much indirect acquisition to science from the trip thus sketched out, it being almost entirely untrodden ground to any scientific observer, and of course it is to be expected that much benefit, in an economical point of view, might result to the state from the researches and suggestions of one who could bring to knowledge the unlimited productions of the vegetable and mineral kingdoms in the regions in question.

8. In case you should not have forwarded a copy of your circular to Captain FISHER, I shall do so, and request him to make a report to you upon the subject of it with reference to Cachar.

Extract of a private letter from Captain F. JENKINS *to* G. J. GORDON, *Esq. dated the 19th May,* 1834, *with enclosures.*

Since I wrote you officially, I have had the enclosed note from Lieut. CHARLTON of the Assam Light Infantry, regarding tea, and I have been presented with the enclosed luminous map* of the tea districts in Upper Assam by a Phokun who accompanied Lieut. BURNETT in an expedition to the top of the Patkoye range of hills, dividing the waters of the Burhamputra from those of the Kuenduen. On this range of hills the trees grow in great abundance, and are described to reach the size of small forest trees or very large shrubs. You will see how he says the leaves are treated, which though it seems rather an odd mode of manufacture, he and others persist in saying is the way in which the Singphos manage the tea. I never had an opportunity of trying it, but those who had said it was palatable enough, and the leaves thus prepared keep for ever.

Copy of a letter from Lieut. CHARLTON *to Captain* JENKINS, *dated on the Burhamputra, the 17th May,* 1834, *enclosed in the preceding.*

With regard to the circular from the Tea Committee which you showed me at Gowahatty, I have much pleasure in communicating the little I know of the tea plant of Assam. I was informed about three years ago of its being found growing wild in the vicinity of Beesa at

* This map being of the most crude description is omitted here. It did not accompany the Committee's Report to Government.

the foot of a low range of hills and in the subjacent plains, from whence I obtained three or four young trees, which I gave to Dr. JOHN TYTLER in Calcutta, with a view of their being planted in the Government Botanical Garden. I have since understood they decayed soon after.

The soil where they grow was described to be alluvial like most parts of Assam, and the trees rising to the height of twelve or fourteen feet more, either at the foot or a small distance up the hills, but never on the summit; from which I infer a sheltered situation to be most favorable. The aspect was generally southerly or south-east. I am sorry I cannot give you a minute description of the plant, not having it now before me; but so much I recollect, the leaves were about two inches in length and one in breadth, alternate, elliptic-oblong and serrate. The flower white, very like that of the wild white rose, but much smaller. The seed I have not seen; it was described to be contained in a red, round, three-lobed capsule, the lobes detached or bursting along the upper sides, with a single seed in each. From what I have seen of the tea plant in different parts of the world, and lately in New Holland, propagated by seeds brought direct from China, I have little doubt but that *that* found near Beesa is a species of tea; and though it may be spurious or even a Camellia, as Dr. WALLICH suggests, its growing there indigenous and in great abundance affords good grounds for supposing that the introduction of the Chinese plant into Upper Assam would be attended with success. I have not had an opportunity of making any experiment on the leaves; they are described as small in their green state, but acquire the fragrance and flavour of Chinese tea when dried. The Singphos and Kamtees are in the habit of drinking an infusion of the leaves which I have lately understood they prepare by cutting them into small pieces, taking out the stalks and fibres, boiling and then squeezing them into a ball which they dry in the sun and retain for use. I have written to Sadiya for a specimen of the tea prepared in this manner, and for plants and seeds; I will send you some if I am able to procure them, and write to you on this subject more fully by and bye.

Copy of a private letter from Lieut. CHARLTON *to Captain* JENKINS, *dated at Sadiya, the 8th November,* 1834.

I have now the pleasure of sending you some seeds and leaves of the tea tree of Assam, and am sorry that the unsettled state I have been in for the last three months has prevented my sending them so soon as I intended. The leaves you could have had before, but I was anxious to make them into something like tea, the best test that the tree is not a Camellia, as Dr. WALLICH imagines. It appears coarse, owing to the leaves being large and much too old, which could not at

the time be obviated. By the end of the cold weather, when the young leaves are on the trees, I hope to send you as good black tea as we generally receive from China. I will make experiments in the interim in the art of preparing green.

The tree I now find is indigenous to this place as well as Beesa, and grows wild every here and there, all the way from this, about a month's journey, to the Chinese province Yunnan, where I am told it is extensively cultivated. One or two people from that province have assured me, that the tea tree grown there exactly resembles the species that we have here ; so I think there can be no longer any doubt of its being *bonâ-fide* tea. What a pity there is no means of communication between Sadiya and Yunnan. A good land-road made only as far as Hookam, and there are no natural obstacles of any consequence to prevent it, would afford an outlet for British merchandize into the very heart of China.

Copy of a note from Captain F. JENKINS *to Dr.* WALLICH, *on the back of the above, dated (at Gowahatty)* 22*nd November*, 1834.

I have only time to send this and to say, I have sent a jar of tea-leaves and a box of tea seeds to go by to-day's dâk, I hope you will see from the seeds that there is no doubt ours is genuine tea.

Memorandum explanatory of the sketches which accompany the report of the Committee of Tea Culture.

There is no danger of mistaking any plant for the tea except the Camellia. Both are very closely allied to each other in general appearance, in the form of their leaves and the structure of the flowers. It is by the character of the fruit alone that they can be satisfactorily distinguished for practical purposes ; in that respect the two genera differ very widely.

In both the fruit consists of a roundish, more or less triangular, dry capsule, of three distinct cells, each cell containing one solitary seed or nut. At the period of maturity the dehiscence or bursting takes place vertically, by means of three fissures, extending from the top of the capsule towards its base. So far their capsules are precisely alike ; the following are the points of difference.

In the tea, the capsule is more or less deeply divided into three globular lobes, sometimes appearing as if it consisted of three round capsules united into one. The general outline is therefore always decidedly triangular, with extremely obtuse corners. The bursting proceeds along the middle of the lobes or angles, when a large seed is discovered through each aperture enclosed on all sides within its proper cell, which cell is in fact formed by the corresponding lobe of the fruit.

By this process six valves are, properly speaking, formed, (and not three, as they are generally counted,) each lobe splitting into two hemispherical valves. The partitions alternate with the lobes, and are formed by the sides of two adjoining cells being, as it were, glued together, and extending to the axis of the capsule, from which they at length completely detach themselves, when it disappears altogether. The seeds or nuts are almost globular.

In Camellia the capsule is very obscurely triangular without any tendency to become deeply three-lobed. It bursts along the middle of each side (consequently alternately with the corners) into three very distinct valves, each of which belongs to two adjoining cells, because the three partitions originate lengthwise from the middle of the respective valves, and are therefore opposite or contrary to these, converging from thence to the triangular axis, from which they gradually separate, leaving it finally unconnected and free. The seeds are of an oval oblong shape, smaller than those of the tea.

The preceding remarks are made with reference chiefly to the Assam Tea and the Nipal Camellia; and purposely without technical precision, the object being simply to convey a general idea of the structure of the two sorts of fruit. But they admit of being applied with safety to all other instances of comparison between the genera in question.

References to the Figures in Plate III.

A The Assam tea. *Figs.* 1, 2, 3, ripe capsules scarcely enlarged; at 1, seen from below, deeply three-lobed; 2, the common form, commencing to burst; 3, the same completely burst open, and discovering the seeds; 4, the same, the seeds being removed, and one of these represented separately; of the natural size; 5, the lower half of a ripe capsule divided by an horizontal section and the seeds removed, exhibiting the places of dehiscence along the angles or lobes, and the partitions alternating with these and separating from the axis; a little enlarged; 6, outline of a full-grown leaf, of the natural dimensions.

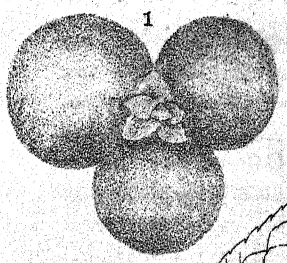
B The Nipal Camellia (*C. kissi*). *Fig.* 7, ripe and entire capsule slightly enlarged; 8 and 9, the same after bursting, the free axis being seen in the last figure; 10, a horizontal section as in the tea, much enlarged, representing the places of bursting, which alternate with the angles of the fruit, the partitions which are opposite to the angles of the fruit, and the valves, separating from the free axis; 11, a detached seed, natural size; 12, outline of a full grown leaf.

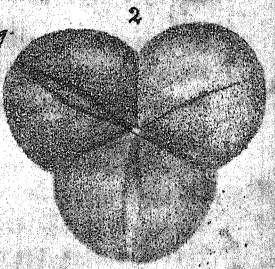
(Signed), N. WALLICH, M. D.

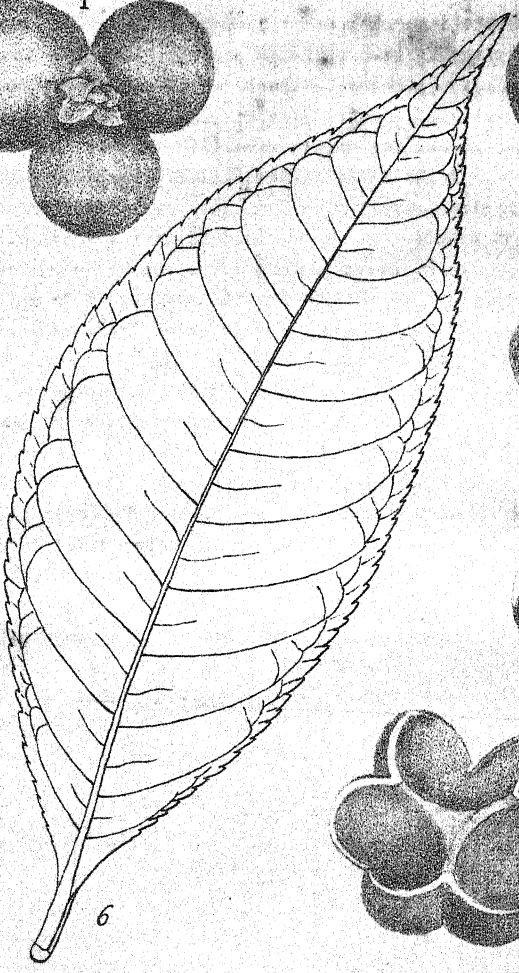
Off. Sec. to the Com. of Tea Cult.

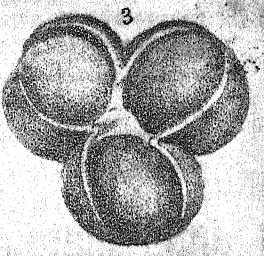
H. C. Bot. Garden, Dec. 24, 1834.

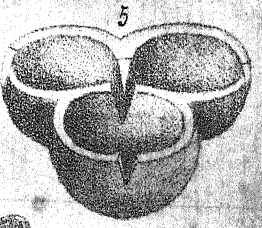
Assam Tea

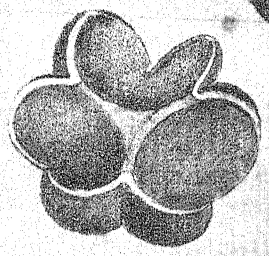


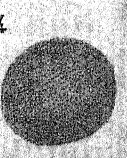




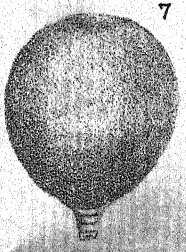


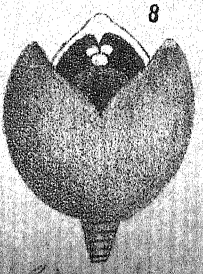


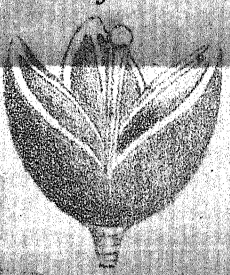


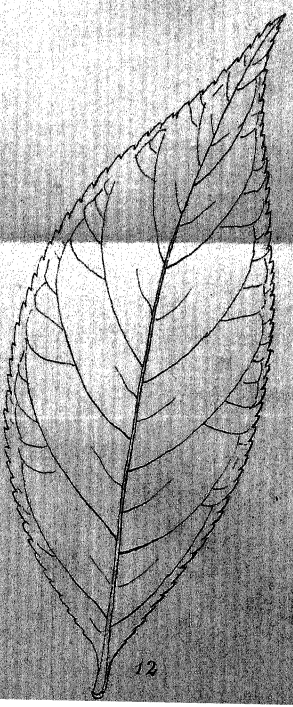


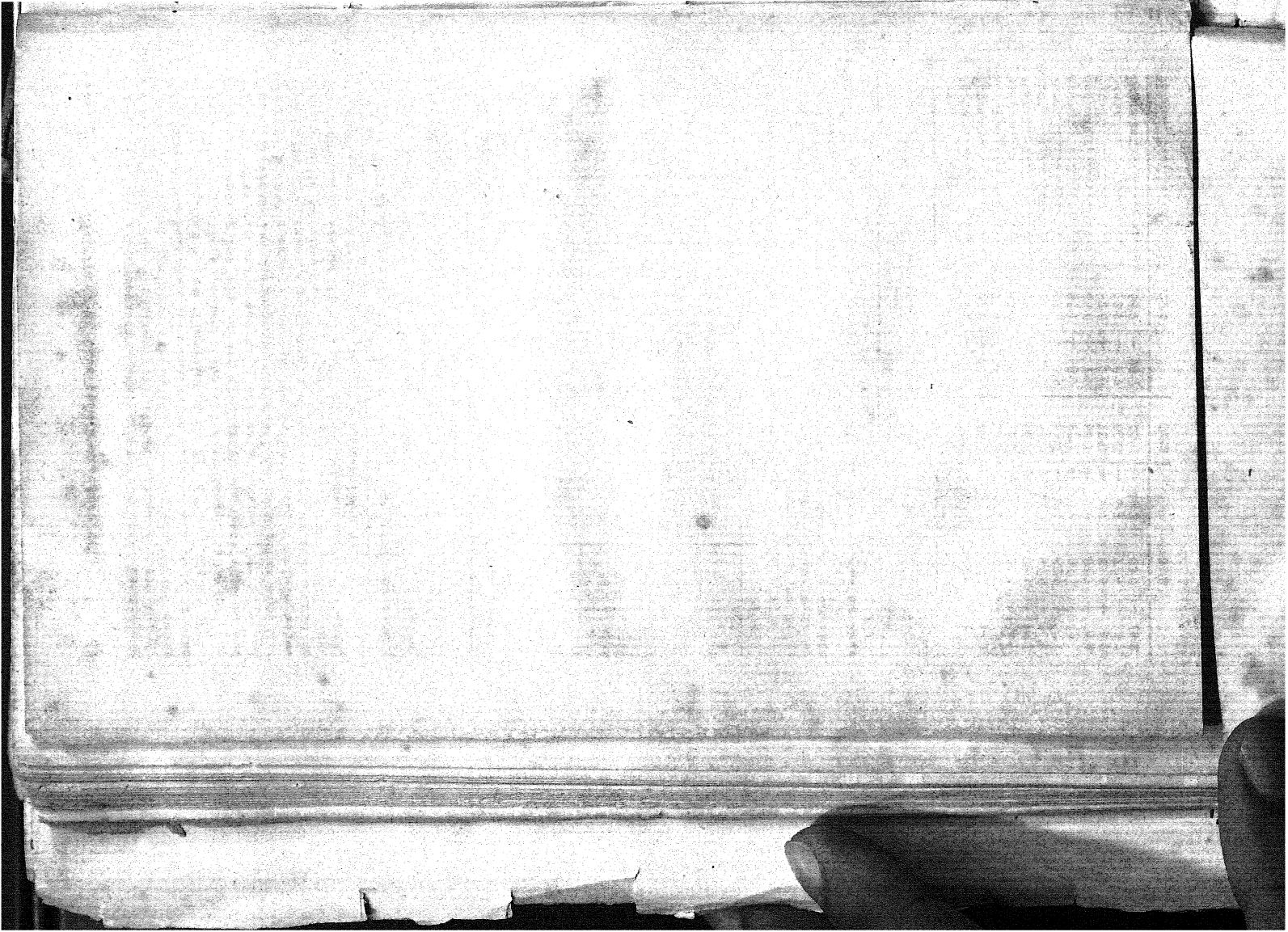
Nipal Camellia











[In the foregoing correspondence, allusion is made to a prior knowledge of the tea-plant of Assam. The following extract from Captain WILCOX's Memoir of a Survey of Assam, published in the Asiatic Researches XVII. p. 448, proves that officer to have been aware of its existence in the hills east of Sadiya:—he writes from Manché, a Khamti village, latitude 27° 29′ 16″, longitude 97° 29′:—"according to promise, a specimen of the tea tree was brought to me from one of the neighbouring low hills; it was a full grown one, that is about five feet high; the leaves were coarse and large, and not numerous." Mr. SCOTT and Captain DAVIDSON had also frequently seen it, and the latter officer says, that black tea is now brought to Goalpara from the Bhotan hills. In 1828, Capts. GRANT and PEMBERTON sent specimens of what the natives asserted to be the tea plant to Mr. Secretary SWINTON, from Mánipur, but for want of the fruit, its genuine nature was not identified. These travellers made tea from its leaves, and found it approach very nearly in flavour to ordinary black tea.—ED.]

V.—*Abstract of Meteorological Observations at Nasírabád. By Lieut.-Col.* THOMAS OLIVER.

TABLE I.—*Barometer reduced to 32°. Temperature of the External Air, and resulting elevation above Calcutta.*

Year and Month.	Barom. at 4 P.M.	Temp. of Air.	Elevation.	Year and Month.	Barom. at 4 P.M.	Temp. of air.	Elevation.
		°	Feet.			°	Feet.
Dec. 1832, ..	28·432	55·7	1461	Dec. 1833, ..	28·391	65·4	1518
Jan. 1833, ..	·504	71·4	1440	Jan. 1834, ..	·402	70·0	1511
Feb.	·392	74·5	1437	Feb.	·392	76·5	1501
March, ...	·334	84·8	1431	March, ...	·281	86·5	1538
April, ...	·234	96·9	1460	April, ...	·212	93·8	1556
May, ...	·059	102·4	1545	May, ...	·101	103·8	1512
June, ...	·031	102·2	1518	June, ...	27·980	101·0	1572
July, ...	27·965	97·1	1543	July, ...	·977	88·1	1576
Aug.	28·021	93·9	1543	Aug.	28·001	88·2	1534
Sept.	·090	98·5	1507	Sept.			
Oct.	·296	93·7	1484	Oct.			
Nov.	·425	80·6	1497	Nov.			
	28·232	88·5	1489				

It is remarkable that the elevations for the nine months, since December, 1833, are all with one exception so much in excess to those for the same months of the former year: I am at a loss to account for this; the average height of my Barometer for the nine months in question being only ·026 lower than the average for the same months of the preceding year.

TABLE II.—*Mean Temperature of each Month, with the Differences from the Mean of the Year.*

Months.	Temp. Day.	Diff. from Mean.	Temp. Night.	Diff. from Mean.	Temp. Sun-set.	Diff. from Mean.
	°	°	°	°	°	°
January, ...	61·5	— 17·9	57·9	— 17·4	66·0	— 15·8
February, ...	67·8	— 11·6	60·5	— 14·8	67·7	— 14·1
March, ...	75·4	— 4·0	71·9	— 3·4	80.7	— 1·1
April, ...	85·2	+ 5·8	80·9	+ 5·6	88·5	+ 6·7
May, ...	94·6	+ 15·2	89·9	+ 14·6	96·9	+ 15·1
June, ...	93·6	+ 14·2	88·8	+ 13·5	94·6	+ 12·8
July, ...	88·3	+ 8·9	84·7	+ 9·4	88·0	+ 6·2
August, ...	86·1	+ 6·7	82·1	+ 6·8	86·4	+ 4·6
September, ...	86·6	+ 7·2	83·1	+ 7·8	87·7	+ 5·9
October, ...	82·0	+ 2·6	78·0	+ 2·7	85·5	+ 3·7
November, ...	72·7	— 6·7	69·6	— 5·7	77·1	— 4·7
December, ...	58·7	— 20·7	55·6	— 19·7	63·0	— 18·8
Means, ...	79·4		75·3		81·8	

TABLE III.—*Temperature of the Air, and Depression (D) of Wet Thermometer.*

Year and Month.	Sun-rise.		2½ P. M.		4 P. M.		Sun-set.	
	Temp.	D.	Temp.	D.	Temp.	D.	Temp.	D.
	°	°	°	°	°	°	°	°
December, 1832, ...	48·1	7·6	71·3	18·6	65·7	14·3	64·5	15·4
January, 1833, ...	50·4	9·7	73·3	20·0	71·4	19·1	66·2	16·7
February, ...	52·3	10·4	76·0	20·0	74·5	19·5	65·0	15·5
March, ...	62·7	13·4	86·7	27·1	84·8	26·3	80·3	23·6
April, ...	75·3	20·0	98·8	34·2	96·9	32·9	89·8	27·9
May, ...	82·7	15·6	105·6	34·3	102·4	32·6	96·1	28·2
June, ...	81·9	12·1	104·8	30·0	102·2	28·6	94·5	23·7
July, ...	82·3	7·5	99·8	23·1	97·1	19·2	91·5	15·7
August, ...	78·5	6·4	95·3	19·6	93·9	18·8	89·0	15·3
September, ...	80·9	11·1	100·3	25·9	98·5	25·2	92·6	22·3
October, ...	73·6	15·4	96·5	30·4	93·7	28·8	88·4	25·9
November, ...	62·1	8·2	83·5	20·8	80·6	19·3	77·1	17·4
December, ...	48·5	4·9	67·4	13·6	65·4	13·0	61·5	11·1
January, 1834, ...	49·0	9·4	73·2	20·8	70·0	19·0	65·7	17·4
February, ...	54·3	9·0	78·7	23·4	76·5	22·5	70·4	17·8
March, ...	63·4	13·8	88·4	28·1	86·5	27·2	81·1	23·6
April, ...	71·0	16·2	96·8	31·8	93·8	30·3	87·3	26·6
May, ...	83·5	18·4	105·8	36·6	103·8	35·4	97·6	31·1
June, ...	84·0	12·3	104·1	27·8	101·0	25·5	94·7	21·9
July, ...	80·8	4·4	90·8	12·8	88·1	10·6	84·5	7·3
August, ...	76·9	3·7	89·9	13·1	88·2	12·4	83·8	8·6
September, ...	75·9	2·5	89·7	12·5	..	..	82·9	7·6
October, ...	67·4	5·7	89·4	21·9	..	..	82·5	17·4

TABLE IV.—*Dew Point (S), Comparative Tension (T), and Grains of Aqueous Vapour in a cubic foot of Air (G).*

Year and Month.	S.	T.	G.	Year and Month.	S.	T.	G.
	°				°		
Dec. 1832, ..	32·2	·371	2·42	Dec. 1833, ..	40·2	·525	3·15
Jan. 1833, ..	28·4	·294	2·11	Jan. 1834, ..	27·3	·289	2·04
Feb.	32·0	·265	2·36	Feb.	29·4	·261	2·15
March, ...	28·0	·189	2·03	March, ...	30·6	·198	2·20
April, ...	30·0	·139	2·11	April, ...	34·7	·180	2·52
May, ...	30·0	·110	2·08	May, ...	41·3	·163	3·13
June, ...	59·0	·326	5·66	June, ...	64·3	·382	6·69
July, ...	69·5	·500	7·93	July, ...	74·3	·694	9·37
Aug.	67·7	·531	7·50	Aug.	71·9	·689	8·70
Sept.	60·5	·373	5·96	Sept.	72·7	·722	8·94
Oct.	40·5	·212	3·03	Oct.	55·4	·459	5·17
Nov.	46·4	·401	3·87	..	..	..	..
Means, ...	43·7	·309	3·92	Means, ...	45·2	·415	4·91

The means for the last year are probably but little affected by the want of observations in November, since the hygrometric state of the air for that month appears to differ not very much from the mean of the year.

[The formula whence the dew-points in the above table are taken will be found in the first Volume of the JOURNAL, p. 508, and in the GLEANINGS IN SCIENCE, i. 193.—ED.]

Mean Results of four Years' Observations.

Months.	Barometer at 32°		Temperature of Air.		Mean Temperature.		S.	T.	G.
	4 P. M.	var.	4 P. M.	var.	Day.	Night.			
	inches.		°		°	°	°		
January,	28.475	+.232	70.6	—17.0	60.9	57.5	31.6	.550	2.36
February,	.387	+.151	72.2	—11.4	66.4	59.0	34.9	.368	2.66
March, ..	.316	+.080	84.0	— 4.4	73.5	70.5	34.9	.265	2.66
April, ...	.224	—.010	95.5	+ 5.6	83.6	81.5	37.4	.194	2.80
May, ...	.109	—.127	101.8	+14.7	92.6	88.2	40.1	.175	3.06
June, ...	27.997	—.239	100.7	+14.6	92.5	87.7	63.3	.388	6.52
July, ...	.974	—.262	92.8	+ 9.6	87.5	83.8	71.7	.604	8.60
August, ..	28.024	—.212	88.8	+ 5.7	83.6	81.1	71.5	.679	8.60
September,	.137	— 099	90.9	+ 6.1	84.0	80.9	66.4	.578	7.39
October,..	.305	+.069	90.2	+ 2.3	80.7	76.8	46.7	.334	4.00
November,	.431	+.195	79.3	— 7.7	70.2	66.7	43.2	.392	3.47
December,	.451	+.215	67.3	—18.3	59.6	56.7	38.2	.479	3.05
Means, ..	28.236	.478	86.2	33.0	77.9	74.2	48.3	.417	4.60

The mean temperature (day and night) from these four year's observations is 76°; but as Nasírabád is elevated above the level of the sea nearly 1500 feet, the air is or ought to be cooler on that account by about 5°·5, so that the temperature at the sea level would be 81·5, which is that assigned to the equator by HUMBOLDT.

If we calculate the mean temperature for the latitude (26° 18′) by the formulæ which have been found in most cases to agree well with observation, we shall have,

By MAYER's,.....	T (= 84°—52° $\sin^2$ L)	= 73·8
BREWSTER's,....	T (= 81°·5 cos. L)	= 73·1
DAUBUISSON's,..	T (= 27^d $\cos.^2$ L in centesimal degrees*)	= 71·0
ATKINSON's,.....	T (= 97°·08 $\cos.^{\frac{3}{2}}$ L—10°·53)	= 71.9
	Mean	= 72.5

which is 9° less than the observations give when reduced to the sea level. But it must be observed with regard to the locality of Nasírabád that it stands on an arid rock on which scarcely any vegetation exists unless during the rainy season: this will no doubt account for a part of the difference. Mr. ATKINSON in his elaborate paper on Astronomical and other Refractions, (vide Memoirs of the Royal Astronomical Society, 2nd volume,) considers that 4° may be deducted from the observed temperatures of "large extended plains:" allowing this, we have still 5° unaccounted for. However, on calculating by the same formulæ, the mean temperatures of several places in this country where observations have been made and recorded in this Journal, I find similar differences, part of which may very probably be owing to errors in the instruments used, as it is well known how great a difference exists in the thermometers manufactured for exportation to this country, no two of which are hardly ever found to agree in their indications, some differing several degrees from others. In the subjoined table, the latitudes and elevations of some of the places are given by rough estimation, not having at hand the means of ascertaining them accurately, but any probable errors in these estimations cannot affect the results materially. The difference of temperature due to elevation has been calculated by Mr. ATKINSON's Formula, viz.

$$\text{Required diff. in degrees} = \frac{h}{251 + \frac{h}{200}}, \quad h \text{ being the elevation in feet.}$$

* Or, in Fahrenheit's Scale.. .T=80°·6—48°·6 $\sin.^2$ L.

24712

Comparison of Observed Mean Temperatures with those deduced from the Formulæ of MAYER, BREWSTER, DAUBUISSON, *and* ATKINSON.

Places.	Latitude.	Height in feet.	Observed Mean Temperature.	Difference due to Elevation.	Obd. Mn. Temp. reduced to the sea level.	Mean Temp. by the Formulæ.	Difference between the calculated & observed Mean Temperature.
	o		o	o	o	o	o
Gazípúr,.....	25.30	400	77·4	1.6	79.0	73.1	—5.9
Fattigurh,....	27.20	600	75·6	2.4	78.0	71.6	—6.4
Seringapatam,	12.30	2412	77.1	9.2	86.3	80.6	—5.7
Nasírabád,....	26.18	1487	76.0	5.5	81.5	72.5	—9.0
Delhí,.....	28.27	800	73.4	3.1	76.5	70.7	—5.8
Calcutta, ...	22.50	100	78.1	0.4	78.5	75.0	—3.5
Landour, ...	30.20	7000	56.7	24.5	81.2	69.1	—12.1

VI.—*Longitude of Nasírabád by Lunar Transits and by Observations of Moon Culminating Stars.—By Lieut.-Col.* THOMAS OLIVER.

By Lunar Transits.

Months.	Longitude.	Sums of Seconds.	Means.
	H. M. S.		H. M. S.
February 16th, 1831,.....	4 58 44	44	4 58 44
Ditto 22nd,.....	.. 59 10	114	 57
March 21st, ...	.. 58 57	171	 57
Ditto 22nd, ...	.. 59 12	243	 61
September 14th,.....	.. 58 52	295	 59
Ditto 15th,.....	.. 58 47	342	 57
November 12th,.....	.. 59 21	423	 60
Ditto 13th,.....	.. 59 05	488	 61
February 8th, 1832, ...	.. 58 41	529	 59
Ditto 10th,.....	.. 59 07	596	 60
March 9th,.....	.. 59 12	668	 61
Ditto 10th,.....	.. 59 00	728	 61
Ditto 12th,.....	.. 59 00	788	 61
April 8th, ...	.. 59 07	855	 61
May 7th,.....	.. 59 29	944	 63
Ditto 9th, ...	.. 58 50	994	 62
June 6th,.....	.. 58 59	1053	 62
Ditto 7th, ...	.. 58 49	1102	 61
October 1st, ...	.. 58 50	1152	 61
November 1st, ...	.. 59 09	1221	 61
Ditto 29th,.....	.. 58 52	1273	 61
March 1st, 1833, ...	.. 59 09	1342	 61
Ditto 28th,.....	.. 59 05	1407	 61
Ditto 30th,.....	.. 59 05	1472	 61
Ditto 31st,.....	.. 59 04	1536	 61
April 28th,.....	.. 58 57	1593	 61
Ditto 29th,.....	.. 59 16	1669	 62
Ditto 30th,.....	.. 59 18	1747	 62
November 17th,..	.. 59 00	1807	 62
Ditto 19th,.....	.. 58 42	1849	 62
Longitude by Lunar Transits,	..	..	= 4 59 02

By Moon Culminators.

Date.	Stars.	Intervals in Sidereal Time.	Longitude.	Sums of seconds multiplied by the No. of stars observed.	Means.
1834.		M. S.	H. M. S.		H. M. S.
Jan. 16th, ..	μ Piscium, ..	—43 48·47	4 58 56	56	4 58 56
Jan. 18th, ..	ξ Ceti, ...	+ 4 16·09	 52	160	.. 53
	....	—27 30·16			
Jan. 19th, ..	μ Ceti, ...	+20 33·68			
	λ	+ 5 42·92	 60	340	.. 57
	f Tauri,....	—25 10·92			
Feb. 18th, ..	ι Tauri,....	+20 10·62			
	H Gem.	—40 40·58	 64	532	.. 59
	η	—51 30·34			
March 16th,	α Tauri, ...	—28 13·52	 48	580	. 58
March 17th,	α Tauri, ...	+24 59·84			
	ζ	—36 19·96	 65	775	.. 60
	C	—51 30·38			
March 19th,	μ Gem.	+34 56·58			
	ϵ	+14 08·40	 64	967	.. 60
	β	—47 17·70			
March 20th,	β Gem.	+14 41·18	 56	1079	.. 60
	δ Cancri,....	—45 24·46			
April, 18th,..	ξ Cancri,....	+28 27·10			
	α Leonis, ..	—31 16·12	 44	1211	.. 58
	γ	—42 33·64			
April 19th, ..	α Leonis, ..	+28 07·98			
	γ	+16 50·40	 69	1418	.. 59
	σ	—41 55·32			
May 17th, ..	ρ Leonis,....	+39 41·06			
	χ	+ 7 17·52	 75	1718	.. 61
	γ Virg.	—33 35·14			
	π	—48 37·70			
May 18th, ..	ν Virg.....	+22 03·22			
	π	+ 7 00·62	 67	1986	.. 62
	γ	—33 53·12			
	δ	—47 52·56			

Longitude by Moon Culminators,..... .... = 4 59 02

The exact agreement of the two is of course a mere chance: I think it right however to mention that I have inserted the whole of my observations, and not a selection from them.

VII.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 14th January 1835.

The Reverend W. H. Mill, D. D. Vice-President, in the Chair.

After reading the Proceedings of the last Meeting, the Meeting passed to the Ballot for the Office-bearers of the ensuing year, when the Lord Bishop, the Rev. Dr. Mill, Sir J. P. Grant, and Mr. W. H. Macnaghten were elected Vice-Presidents; and the Members composing the Committee of Papers last year were unanimously re-elected.

The Honorable Mr. J. B. MACAULAY, the Honorable Colonel W. MORRISON, and Mr. WILLIAM CARR, proposed at the last Meeting, were duly elected Members of the Society.

The Secretary read an Annual Report on the state of the Society.

For the whole of the past year, the Society had been deprived of the presence of its President, who had been driven to the Cape through ill health. The seats of two Vice-Presidents had also become vacant, one by Sir J. FRANK's departure to Europe, the other, by Sir C. T. METCALFE's appointment to the Government of Agra. The Obituary List of the past year contained only the venerable name of Dr. CAREY, upon whose death, in June last, a tribute of regret and esteem had been recorded on the Society's proceedings. The fate of another cherished Member, Mr. J. CALDER, remained an object of great anxiety, nothing having been heard of him since he sailed from India for the New Colony at St. George's Sound in October, 1833. The only faint hope of his safety rested in the report of some natives at Swan River, that a wreck had occurred to the northward; and it was satisfactory at least to know, that a vessel had been immediately despatched to ascertain the fact. The result has not yet transpired.

Of Members who had tendered their resignation for various causes, the following names were mentioned: Messrs. G. MONEY, M. T. CLEMISHAW, M. LARUZETTA, M. MANUK, and Raja KALIKRISHNA.

The new Members elected, including those of the present Meeting, amounted in number to fifteen, viz. Messrs. W. MARTIN, R. SPIERS, A. BEATTIE, J. S. STOPFORD, W. MACKENZIE, F. RENAULD, Dr. A. HAMILTON, Lieut. W. FOLEY, Lieut. McLEOD, Lieut.-Col. LOW, Sir J. P. GRANT, Mr. W. GRANT, Honorable T. B. MACAULAY, Honorable Colonel MORRISON, and Mr. W. CARR.

The following distinguished individuals had been associated as Honorary Members: The MEKHARA MENG of Ava, Mr. CSOMA DE KÖRÖS, Professors HEEREN, KLAPROTH, ROSEN, and BUCKLAND, Sir JOHN HERSCHEL, and Col. SYKES.

The Expences of the year had been very moderate, leaving a considerable balance in the Treasurers' hands.

PAYMENTS.				RECEIPTS.			
To paid for Copies of the Journal Asiatic Society, furnished to Members in 1833, ...	928	0	0	By balance of last year, ..	20	8	5
To Establishment and contingent expences from 1st Nov. 1833 to 31st Oct. 1834, ...	2880	6	0	By Subscriptions collected,	5472	6	0
To balance of cash in hand,	3101	10	4	By Interest on Company's Paper, 17,500, at 5 per cent.	1417	1	11
Sa. Rs.	6910	0	4	Sa. Rs.	6910	0	4

Outstanding Quarterly Bills due, but not yet collected, Rs. 2817.

The Publications of the past year had been limited to the Index of the 18 volumes of Quarto Researches, now nearly completed, and the Monthly Journal. The printing of M. CSOMA DE KÖRÖS's Tibetan Grammar was terminated, which would allow a new volume of Researches immediately to be put in hand. The Government had been pleased to express its approbation of the manner in which the Tibetan Dictionary and Grammar have been passed through the press, and

had requested that the Asiatic Society would undertake to distribute copies of the work to the principal learned Societies and Universities of Europe and India. In complimenting the Author upon the successful performance of his task, and ordering payment of printing expences, and arrears of salary, the Governor General was further pleased to direct the sum of money remitted to M. Csoma by Prince Esterhazy and other Hungarian Noblemen in 1832, which was unfortunately lost by the failure of the house of Alexander and Co. to be restored out of the public purse, an act of liberality which will doubtless be appreciated in Vienna.

The Papers submitted to the Society, during the past year, had embraced the discoveries of Bactrian Antiquities by General Ventura, M. Court, Dr. Martin, Mr. Masson, Dr. Gerard, Syed Kera'met Ali, and Mohun Lal. The notice of various Hindu Inscriptions, and particularly the Translation of one of the Allahabad Inscription, by Captain Troyer and Dr. Mill:—the discovery of a submerged town, replete with antiquities, by Captain Cautley; and many other subjects of considerable interest. In physical research, the progress of discovery had been unprecedently rapid, and the gigantic fossil bones exhumated from the lower range of hills, by Dr. Falconer and Captain Cautley, had even surpassed the noble specimens presented by Dr. Spilsbury. It was now rendered most probable that a belt of fossil deposit existed throughout the whole line of secondary hills skirting the great Himálayan ridge from Cashmir to Ava. It had been penetrated in a few places—at Sewalik, Kooch Behar, and on the Irawadí; but for many years, it might be anticipated that other spots yet unexplored would continue to furnish abundant stores for the investigation of the geologist and the speculation of the cosmogonist.

Library.

Read a letter from Monsieur Lair, Secretary of the Society of Agriculture and Commerce at Caen, forwarding copies of the various publications of that Society for the past two years.

Read a letter from Monsieur Dutrouille, Secretary of the Royal Academy at Bordeaux, forwarding copies of its proceedings, &c. for the years 1832 and 33, and proposing an exchange of publications.

Read a letter from Professor J. J. Marcel, acknowledging his election as an Honorary member, and presenting his recent publications:

Histoire de l'Egypte depuis la conquête des Arabes jusqu'à celle des Français.

Contes Arabes du Shekh el Mohdy, Nos. 10, 11, 12, 13.

The following Books were also presented:

Journal of a Tour through the Panjab, Afghanistan, &c. in company with Lieut. Burnes and Dr. Gerard, by Munshi Mohan La'l, a native of Delhi—*by the author.*

Papers relative to the Mahratta War in 1833-4, *by Mr. G. T. Lushington.*

Hitopadesi, with a Hindee translation, made by a Pundit of the Raja of Bhartpur—*by ditto.*

Prithivi Raja Basa, a Hindee Poem, by Chand,—*by ditto.*

Journal Asiatique, No. 77, August, 1834—*by the Asiatic Society of Paris.*

Meteorological Register, Nov. and Dec. 1834—*by the Surveyor General.*

A lithographed map of the Indus and the neighbouring countries, from the

The Government maps—*by M. J. B. Tassin, Artist and Publisher.*

The Indian Journal of Medical Science, No. 13—*by the Editors.*

The following books were received from the Booksellers.

Marsden's Numismata Orientalia, 2nd vol.

Lardner's Cabinet Cyclopedia—Sismondi's Roman Empire, vol. 1st.

For the Museum.

A series of Skulls, consisting of 1 Tiger, 5 Antelopes, 3 Chikaras (Reindeer), 1 Hyena, 3 Wolves, and 2 Pariah Dogs; also Models of the Native Plough, of the Cotton and Spinning Wheel, and that of the Mill for grinding Mustard Seed—also models of Carts, &c. used in the Bhartpur Territory, and 2 Mewátté Spears, presented by Mr. G. T. LUSHINGTON.

Antiquities.

Read a letter from Major SUTHERLAND, forwarding the Ancient Inscription presented by Captain J. Low, on the 3rd December.

[A reduced facsimile of this Inscription is given in Plate III.]

An image of Buddha, mutilated in the upper part, was presented by Mr. JAMES STEPHENSON.

A paper was read describing the locality and manner of its discovery at Bukra, near the pillar known as Bhím Sen's Láth in Tirhút. Round the base of the image was a Sanscrit inscription: the sculpture is in good taste and well finished.

Further relics and coins dug up at Behat, near Seháranpur, were received from Captain CAUTLEY.

A letter was read from Captain E. E. WESTMACOTT, 37th N. I. Assistant, Governor General's Agent at Assam, forwarding a description of the town of Sháhpurí in the Udayapur district, and also an account of the Rámsanèhís, a sect of Hindu Schismatics in Western India.

Physical.

A collection of the various formations of tufaceous kankar from the bed of the river Jamna, inclosing shells, wood, and bones, was received from Serjeant DEAN, and a further assortment of the fossil bones discovered therein.

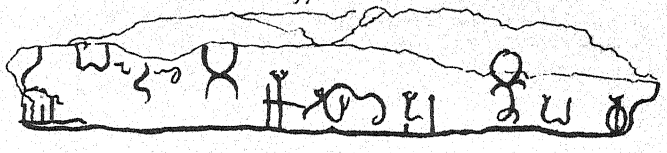
A letter from Dr. SPILSBURY begged the Society would accept of the fossil bones formerly transmitted for its inspection by him.

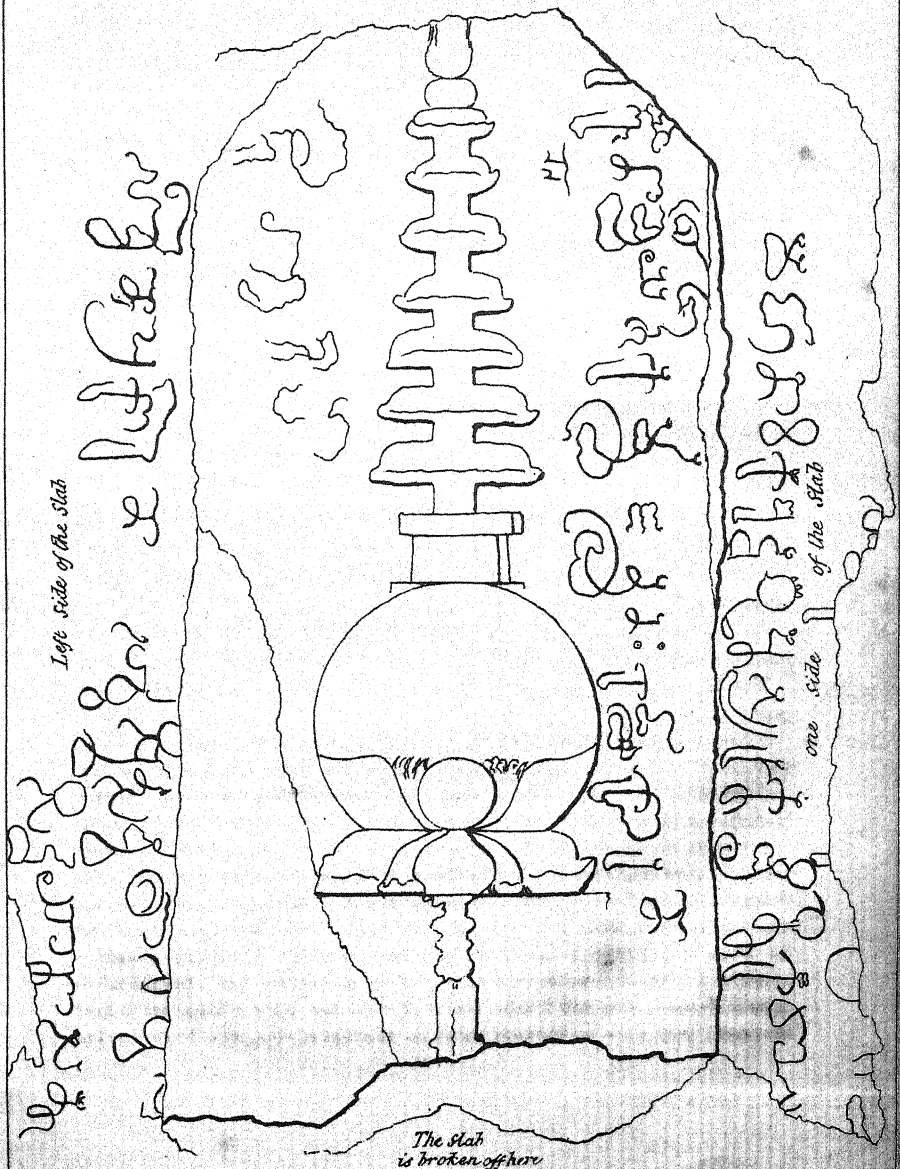
The following extract from a letter from Major COLVIN, Engineers, was read:

"You have been informed of the successful results of the researches which have lately been carried on in the lower hills in this vicinity for fossil remains, and the subject has been taken up with such spirit and desire to attain information, that in all probability valuable use may be made of the facilities for studying the subject so immediately in the vicinity of the deposit; but it has struck me much good might result from the means of pursuing the inquiry being more extended, by the Society's Museum being provided with specimens of the fossil remains of these hills, and as I am neither a geologist nor have the leisure to make myself one, I have obviously no motive for collecting a cabinet myself. I propose therefore excavating and collecting for the Museum of the Asiatic Society, who will I hope accept of what the party I have set to work may find; they have commenced under an intelligent man, who has learned to

Copy of an Inscription on a Stone found near the ruins of a Buddhist Temple in Province Wellesley, Malayan Pen.ª

Upper Side





J. B. Tavin lith.

recognize a fossil at sight, and to be careful in their extraction from the rock when so situated: but so many have been found fallen down from their original position, that many will likely be so now, and the wonder is that they have not been before recognized and brought to notice through the natives in the neighbourhood, who it would now appear have occasionally picked them up. The space I have selected for the operations of my party is the portion of the hills embraced between the embouchures of three mountain torrents, which united form the Sombe river, lying about half way between the Jamna and Nahun, to the right and left of which are the hills from which the specimens already collected have been brought. I may therefore expect to be successful, and though I have not seen the outlets of these three heads of the Sombe, I may presume the sections in the range of hills to be both deep and extensive from the floods which pass down there in the rains. I intend when I have an opportunity to visit them, and in the mean time have taken measures to have the localities of the specimens attached to each as brought out. I expect to be able to despatch the first results of my search from Delhi before three months are over. These fossils appear to me to correspond with those found by Dr. SPILSBURY, described in the Journal for August. One lower end of a thigh bone is little less in breadth than that drawn in the plate, and an end of a corresponding bone of the fore-leg appears to me of equally gigantic dimensions. I believe you have not yet actually seen any thing from these hills, and inclose you a tooth I hammered out of the rock at the Kalowala Pass, wrapped in *Upland Georgia* cotton."

The best thanks of the Society were voted for Colonel COLVIN's obliging offer.

With reference to the same subject, the following extract from a private letter, (received subsequently to the Meeting,) from Dr. H. FALCONER will be read with interest: it is dated Mussooree, 3rd January, 1835.

" You have heard from Capt. CAUTLEY and Lieut. BAKER about the late fossil discoveries up here: I have come in for a lion's share of them. In one of my tours I had to return by Nahun, and having heard of the tooth presented by the Raja, in October, to Lieut. BAKER, I made inquiry and had a fragment of a tooth presented to me also. I got a hint of where they came from, and on going to the ground, I reaped a splendid harvest. Conceive only my good fortune: within six hours, I got upwards of 300 specimens of fossil bones! This was on the 20th November, a couple of days after Lieuts. BAKER and DURAND had got their first specimens through their native collectors.

" Capt. CAUTLEY has since got about 40 specimens: my collection amounts to nearly 400: and it is exceedingly rich and varied. There are more species than Messrs. CRAWFORD and WALLICH got from the Irawaddí. Here are some of the results from a rapid examination of Capt. CAUTLEY's collection, (not including the Kalowala fossils noticed in all his late letters in your Journal,) and my own.

Mastodon Elephantoides. A most perfect cheek tooth, left side of lower jaw, 13½ inches long! indicating an animal of immense size. Portions of the ivory tusks of do., ribs, and huge fragments of bones of the extremities. H. F.'s collection.

Mastodon Latidens? cheek tooth doubtful from being water worn. CAUTLEY's.

Hippopotamus. Fragment of the lower jaw with teeth. H. F.'s collection.

Rhinoceros? doubtful. CAUTLEY's and H. F.'s collections.

Tapir ? doubtful from water-wearing;

Ruminantia. A beautiful entire half of lower jaw of a large deer. H. F.'s.

Crocodile. Vertebræ of immense size, teeth, and other bones. H. F.'s collection.

Chelonians. Two species of Emys, one of Trionyx.

Vertebræ of four distinct mammalia, which the want of means of identifying satisfactorily prevents me from venturing a vague opinion of. A great number of other bones besides, which will admit, many of them, of being determined. There are some traces of new forms of structure: among others a tusk of a Pachydermatous animal, about $\frac{3}{4}$ of an inch in thickness, longitudinally channeled like the tusks of the Hippopotamus, and curved, with its apex worn down to an oblique disk; but having a reniform, transverse section, channeled with a deep fossa along its concave curve. This is but the commencement of the discoveries, and among the Pachydermata, I expect many additional results: either in Anoplothera? Lophiodons and Anthracothera, or analogous forms in their place: and most assuredly Tapirs at least. In fact, in Capt. CAUTLEY'S collection (the Kallowala one from the clay marle) of which he has given you so much of the details, there is a small tooth, which I imagine belongs to an extinct Pachydermatous animal, allied to Anthracotherium. His zeal is beyond all praise. The moment he got the scent, from some bones I found in the Limli pass, he was off to the field in the Kallowalla Pass, and ever since it has been but a continuous search with him. He has lately turned out a beautiful and most perfect molar tooth of the upper jaw, right side, of a species of the genus Equus, which now puts his inference of the existence of Solipeda in the deposit, at first deduced from an incisor tooth, beyond all doubt. It has the roundish solitary lateral pit of the inner side completely surrounded by a ridge of enamel: whereas in existing species, the pit is open internally, and the ridge of enamel which encircles it, is continuous with the other flexures of enamel of the tooth. It therefore, perhaps belongs to a new extinct species. The Lithological details of the Sewálik formation are equally interesting with the fossil ones, and when worked out, will read as instructive a lesson regarding the Geomorphic operations, at the foot of the Himálayas, during centuries of ages past, as the fossil remains do, regarding the former tenants of the tract. By the bye, the fossils I have mentioned, Mastodon Elephantoides, &c. establish an identity of formation between the upper beds of the Irawaddí deposits and the upper deposits included between the Sewálik and the Himálaya range. Several of them are the same as those found by CRAWFORD and WALLICH; and it appears, that all along the foot of the Himálaya, from the Panjáb, down to the Irawaddi, there is a nearly continuous series of tertiary formations, more or less upheaved at different points along the line; but in all their great features, they appear chiefly developed in the Jamna Gangetic portion, where they are upheaved to upwards of 1500 feet above the plains.

In a late excursion to Jamnautri I collected materials for a section from the snowy range on to the plains, like Dr. ROYLE'S, but perhaps more copious. I have found the trap rocks extensively distributed and far in the interior. The whole tract on this side the snow is primitive; and the line of the snowy peaks is primitive also. I am convinced that they are not like the high mountains of the Andes, porphyries and other trappean masses burst through the surrounding formations; but primitive schists upheaved to a higher level

than the surrounding hills. You have heard much of the scenery, but I wish you had seen some of it, for no pencil has yet done justice to it. To mention one: conceive yourself on the top of the Choor mountain, nearly 13,000 feet above the level of the sea, a lofty ridge half way between the snowy range and the plains, high above every thing around. Imagine a glance to the north, or front, with an uninterrupted stretch of upwards of 90°! of snowy mountains, without a break, clear, white, and dazzling, starting up against a back-ground of deep-blue sky, so rich and intense, as you have never seen: conceive an ocean of mountain waves, running on from your feet to the snow, you looking down upon and overtopping all. Turn round to the rear or south, and you have another sea of hills, with the plains of Hindoostan beyond, stretching far off into the distance, and traversed by here and there a streak of silver, marking the miniature course of the mighty Jumna. Look to right and left, and you have a view of mountains, bounded only by the limits of vision: the huge masses of huddled granite about you forming a fine offset to the whole. I imagine that as a panoramic mountain view, that of the Choor is not to be exceeded in any country, and it is but a sample of the rest. The only want is in lake scenery, and of this there is nothing worthy of the name."

VIII.—*Miscellaneous.*

1.—*Explanation of the differences in the quantity of Rain at different elevations.*

It had invariably been remarked by meteorologists that a rain-gauge, placed at an elevation, collected less rain than one situated on the surface of the ground, yet no satisfactory reason could be assigned for such a discrepancy. The British Association for the Advancement of Science determining to place the facts of the phenomenon on such a footing as to be afterwards capable of tolerably strict analysis, engaged Messrs. W. Gray and J. Phillips, to conduct a year's experiments on the top of the Cathedral at York, and the result was made the subject of a report by the latter to the meeting at Cambridge in 1833, which sets the matter at rest in a most satisfactory manner.

The site of the experiments was well selected, York being in the centre of a very extensive valley, and the Minster tower, elevated 200 feet from the ground, looks down upon an area of 1000 square miles, with no object of nature or art rising to within 100 feet of its summit.

One gauge of the simplest construction was attached to a pole, elevated nine feet above the battlements, 242 feet above the river;—another was registered on the roof of the museum, 72½ feet;—and a third on the ground in the museum garden, at 29 feet above the river.

The gauges were 10 inches square, and could be easily read off to the 1000th of an inch fall.

The report gives a tabular view of the whole rain of the year, but it will be sufficient here to notice the totals of the 12 months, which were as follows:

	Minster.	Museum.	Ground.
Total Rain-fall in the year,	15·910	20·461	24·401
or deducting a snow storm in Feb.	15·715	20·182	23·785

Mr. PHILLIPS arranges the numerical results of the experiments, in relation to mean temperature, and the season of the year, so as to deduce the *ratios* of quantity at the several stations, in the following table:

Periods.	Mean Temp.	Of Rain, Inches on Minster.	On museum.	On ground.	Ratios.		
Whole year, ...	48·20	15·715	20·182	23.785	66·1	85·3	100
7 coldest months Oct.—April, ..	40·8	7·089	9·725	12·079	58·6	80·5	100
7 warmest months April—October,	55·5	11·146	13·669	15.666	71·2	87·1	100
5 coldest months Nov.—March,	39·3	4·569	6·414	8.119	56·2	79·	100
5 warmest months,	58·5	8·626	10·457	11.706	73·7	89·2	100
Winter quarter, ..	36·3	1·626	2·326	3.297	49·3	70·5	100
Spring quarter, ..	47·6	3·144	4·202	5.256	59·8	80·	100
Summer quarter,	60·8	6·264	7·414	8.121	77·1	92·5	100
Autumn quarter,..	48·3	4·681	6·240	7.111	65·8	87·7	100

The first remark which occurs on the inspection of this table is that the ratio of diminution of rain for altitude of position is nearly constant. Mr. PHILLIPS shews that it is represented by a simple formula, depending on the square root of the height with one variable co-efficient; or $m \sqrt{h} =$ the diminution of rain at the given height.

Thus for the whole year (m being made $= 2{\cdot}29$)

for the Minster, $m \sqrt{h} = \sqrt{212{\cdot}8} \times 2{\cdot}29 = 66{\cdot}5$, by observation 66·1, to 100.

for the Museum, $m \sqrt{h} = \sqrt{43{\cdot}6} \times 2{\cdot}29 = 84{\cdot}9$, by observation 85·3, to 100.

In like manner for the seven coldest months, ($m = 2{\cdot}88$,) the ratios are found

by calculation,	58	81	100
by observation,	58·6	80·5	100

and for the seven warmest months, ($m = 1{\cdot}97$,) the same quantities are found,

by calculation,	71·3	87·0	100
by observation,	71·2	87·1	100

and so on, for the five-monthly periods of averages. For the shorter periods, the accordance is of course less striking, but it obtains even in single months, and the same formula is found to apply to Dr. HEBERDEN'S experiments on Westminster Abbey, with a due variation in the co-efficient m. Whence it is concluded that the *relation to height* is constant.

But it is evident that the values of the *variable* co-efficient were very different; that its maxima and minima, were, perhaps, not quite in the same periods of the year at Westminster as at York, and that the range of variation in its value is much less. From M. ARAGO'S determination of the relative quantities of rain falling on the observatory at Paris, and in the court below, the relative mean value of m, at Paris $= 1{\cdot}24$; while at Westminster, it is 4·23; and at York, 2·29. These discrepancies are discouraging, and will probably deprive the most exact local determinations of a general application. However, on account of the re-

markable regularity of the progress of monthly temperature at York, and some obvious relations between the quantity of rain collected, and the mean temperature of the period, some inferences unavoidably suggested themselves.

First. The diminution at the upper stations is greatest in the cold, and least in the warm seasons, and therefore the co-efficient is in some way *inversely* dependent on the temperature. Mr. PHILLIPS found the relation very nearly represented by the formula $2m = a\frac{t}{t'} + a\frac{t^2}{t'^2}$ where a = the ascertained value of m for the whole year, t the mean temperature of ditto, and t' that of the particular period.

Secondly. The relation between the values of m and the *dryness* of the air is inverse, whether expressed by the difference between the mean temperature and the dew point, or, as that is seldom known, by the *mean range* of daily temperature, which had been determined for York from a long series of observations by Mr. F. CHOLMELEY, to be as follows:

January range, ..	8·0	May, ...	19·7	September, ...	16·0
February—, ...	10·1	June, ...	20·1	October, ...	11·8
March—, ...	13·1	July, ...	19·6	November, ...	9·0
April—, ...	16·2	August, ...	17·7	December, ...	7·7

General mean daily range, 14·08

Now if m be taken inversely as the mean range of temperature, r, or $m = a\frac{14{\cdot}08}{r}$, the accordance between the calculated and observed values of the co-efficient is very close:

($a = 2{\cdot}29$.)	value of m.		value of m.
for the 7 coldest months, by calculation,	2·98	by observation,	2·88
7 warmest months, ———	1·86	———	1·97
5 coldest months, ———	3·36	———	3·06
5 warmest months, ———	1·73	———	1·73

and so on throughout. The concluding remarks of Mr. PHILLIP'S explain the hypothesis he has framed for the explanation of the phenomenon which led to the experiments, and to us it appears most clear and conclusive.

"So remarkable and continued an accordance between the co-efficients fixed by observation and those derived by two methods from a very simple view of the condition of the air as to heat and moisture, appears to me decisive of the question as to the general cause of the *variation of the quantity of diminution of rain at any one height* above the ground. It has already been shown how strictly the observations warrant the conclusion that the *ratio of diminution at different heights is constant* through the whole year. It is therefore rather as a matter of very probable inference than a plausible speculation that I offer the hypothesis, that the whole difference in the quantity of rain, at different heights above the surface of the neighbouring ground, is caused by the continual augmentation of each drop of rain from the commencement to the end of its descent, as it traverses successively the humid strata of air at a temperature so much lower than that of the surrounding medium as to cause the deposition of moisture upon its surface. This hypothesis takes account of the length of descent, because in passing through more air more moisture would be gathered; it agrees with the fact that the augmentation for given lengths of descent is greatest in the most humid seasons of the year; it accounts to us for the greater absolute size of rain-drops in

the hottest months and near the ground, as compared with those in the winter and on mountains; finally, it is almost an inevitable consequence from what is known of the gradation of temperature in the atmosphere, that some effect of this kind must necessarily take place. The very common observation of the cooling of the air at the instant of the fall of rain, the fact of small hail or snow whitening the mountains, while the very same precipitations fall as cold rain in the valleys where the dew point may be many degrees above freezing is enough to prove this. A converse proof of the dependence of the quantity of rain at different heights on the state of the air at those heights, is found in the rarer occurrence of a shower falling from a cloud, but dissolving into the air without reaching the ground. Lastly, I cannot forbear remarking, that this hypothesis of augmentation of size of the elementary drops agrees with the result that the increase of quantity of rain for equal lengths of descent is greatest near the ground: for whether the augmentation of each drop be in proportion to its surface or its bulk, the consequence must be an *increasing rate* of augmentation of its quantity as it approaches the ground.

"The direct mathematical solution of this problem, now that the laws of cooling and of the distribution of temperature have undergone such repeated scrutiny, may perhaps be attempted with success; but for the purpose of eliminating the effects of periodical or local modifying causes, it is desirable that observations on the same plan should be instituted at many and distant places,—both along the coasts and in the interior,—in the humid atmosphere of Cornwall and in the drier air of the mid-land counties. Always, at least three stations should be chosen, as open as possible, one of them very near to the ground: their relative heights, the mean temperatures, the mean ranges of temperature, and the mean dew point for each month should be ascertained. It would be useful to measure the size of the rain-drops, and, if possible, their own temperature. The height of clouds according to the plan of Mr. DALTON, in his *Meteorological Essays*, and the direction and force of wind should be noted, and distinctions made between snow, hail, and rain. Some of these data I have not yet found the means of procuring, partly in consequnce of the great labour and time required, and partly from the difficulty of well arranging the experiments themselves. But since it is now ascertained that the general results follow some settled laws, and that the effects may be very well appreciated at moderate heights, I hope not only to procure these, but also several other data towards the completion of the theory of this curious subject, the patient investigation of which cannot fail to give us new and penetrating views into the constitution of the atmosphere."

It will be a curious subject of investigation to determine the applicability of the law of altitude and moisture to this country, and to fix the value of m. This latter may, in some measure, be done from the long series of observations published in the Surveyor General's Meteorological Register: but for the law of height, we shall require a higher station, and we invite any zealous meteorologist who may have leisure to fix his pluviameter on the top of the OCHTERLONY monument; a chuprassee may easily be taught to observe it daily throughout the rains.

2. *An unusual Sea-Monster in the Bay.*

[Extract of a Letter from Lieut. W. FOLEY, 25th Nov. 1834.]

On my voyage to Madras (in May last), I saw a most extraordinary fish, and which had never before been seen by any seaman on board, although some of the

officers and crew had been employed in the whale fishery. It was of the size of a whale, but differing from that animal in shape; spotted like a leopard, in a very beautiful manner: it came close under the stern of the ship, during a calm, and we had a magnificent opportunity for viewing it: it had a very large dorsal fin, which it moved about with great rapidity when made angry in consequence of the large stones that we threw down upon it rashly; for it possessed sufficient strength to have broken the rudder and stove in the stern of the ship. Several large fish (seemingly Dog-fish), about a cubit in length and upwards, were gamboling about the monster, entering its mouth at pleasure and returning to the water again. The following will give you some idea of its shape. The mouth very large, dorsal fin black or dark-brown, tail also; body covered with brown spots like a leopard, head lizard-shaped. May it not be the *Plesiosaurus*, or a species of that fish known to have existed formerly in the waters of the ocean? Having given you this statement, it is proper that I should give you the names of those who were also eye-witnesses of the existence of this extraordinary animal. They are as follows:

1. Captain TINGATE, at that time commanding the ship "*Cashmere Merchant*," now commanding the "*Competitor*."

2. Mr. SMELLIE, Mr. PIKE, and Mr. LANDERS, officers of the vessel.

The above gentlemen will corroborate my statement: Captain TINGATE and Mr. SMELLIE were old sailors, and had never before seen the fish, or one resembling it. There were also several European seamen on board, not one of whom had ever seen it before.

[All we can venture to say on this authenticated account is, that the monster described is not a *Plesiosaurus* as Lieutenant FOLEY suggests; as that reptile has no "dorsal fin." What it may be, we must leave others more competent to decide, but the unusual nature of the notice should by no means prevent the insertion of a description supported by such unequivocal evidence.—ED.]

3. *Suspension of the Survey of the Brahmaputra River.*

For the last four years, an accurate trigonometrical survey of the Brahmaputra has been in progress, to connect the map of this river from Goalpára, where it terminated in Captain WILCOX's Survey of the Assam Valley, (see the 138th sheet of the "Indian Atlas," or the lithographed map in the 17th volume of Researches,) with the surveys of the Ganges, the Sunderbans, and finally with the grand meridional arc. Captain WILCOX and Lieutenant OMMANNEY, Engineers, completed the measurement of the Jenai, which now forms the main stream of the Brahmaputra, from Jumálpur to its confluence with the Ganges at Jáfirganj, and the latter officer had in 1830 since been engaged in tracing the line of the river from goalpára round the difficult country at the root of the Kásia mountains, to within 30 miles of Dacca, when a sudden order of Government lately directs the whole work to be suspended, and in fact, all that has been done, to be rendered comparatively useless for want of the connecting link which it would not have taken three months to complete! Geographers at home will be at a loss, as we ourselves are, to account for a measure apparently so impolitic, and we cannot help thinking, that a word of explanation to the proper authorities would still be in time to remedy the mistake.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of January, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain, inches.	Wind.		Weather.	
	Standard Barometer at 32°.	Wet Barometer do.	Aq. Ten. deduced.	Ther. in air.	Wet-bulb Depression.	Leslie's dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Aqs. Ten. deduced.	Thermometer in air.	Wet-bulb depression.	Leslie's dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun		Morning.	Evening.	Morning.	Evening.
1	29,880	,050	,830	70,0	8,0	7,8	86,	,810	,932	,878	71,8	10,5	9,6	81	54,0	90,		nw.	n.	clear.	clear.
2	,894	,120	,774	68,1	7,1	6,7	89,	,766	,858	,908	71,2	11,6	10,7	79	55,	95,		nw.	n.	do	do
3	,920	,134	,786	68,1	8,0	7,0	9,	,808	,920	,888	71,5	10,6	10,3	79	54,	99,8		nw.	n.	do	do
4	,812	,988	,824	69,8	6,5	6,0	92,	,716	,782	,934	73,5	11,8	10,4	81	53,	98,		SW.	sw.	do	do
5	,846	,012	,836	70,2	9,7	8,7	83,	,764	,898	,866	73,4	12,6	11,8	73	60,3	99,8		NW.	nw.	do	do
6	30,016	,240	,776	68,5	9,6	9,4	78,	,898	,070	,828	70,6	12,9	11,7	69	52,9	94,6		nw.	nw.	do	do
7	,068	,386	,682	65,3	10,7	9,9	75,	,098	,198	,900	68,0	12,9	11,7	67	45,0	96,7		nw.	nw.	do	do
8	,068	,408	,660	64,7	8,4	6,8	83,	,922	,166	,756	68,0	13,0	11,9	68	47,1	97,0		nw.	nw.	do	do
9	,050	,386	,664	63,7	8,4	7,8	81,	,920	,156	,764	67,9	13,0	11,8	67	44,5	97,7		nw.	w.	do	do
10	,044	,378	,666	65,2	9,2	8,3	81,	,944	,194	,750	68,6	13,0	12,7	65	42,0	102,8		n.	w.	fog.	do
11	29,971	,300	,671	65,8	8,8	7,7	84,	,024	,335	,689	66,3	7,8	6,7	87	47,7	102,0		W.	w.	clear.	do
12	,837	,074	,763	69,1	12,8	11,6	74,	,912	,146	,766	69,0	12,1	11,3	74	45,2	102,4		w.	w.	do	do
13	,896	,158	,738	68,1	3,4	4,1	93,	,756	,894	,666	72,1	5,7	5,3	93	52,2	96,0		sw.	SW.	fog.	do
14	,970	,234	,736	67,7	5,4	5,3	91,	,850	,060	,790	70,5	12,7	12,2	68	58,5	105,4		nw.	nw.	clear.	do
15	30,014	,340	,674	67,2	10,0	9,6	75,	,894	,124	,770	70,1	13,7	8,0	67	53,2	97,0		nw.	nw.	do	do
16	,004	,388	,616	65,9	7,6	7,6	86,	,860	,166	,694	69,2	14,0	13,7	64	44,0	..		nw.	nw.	do	do
17	29,957	,333	,624	67,1	9,4	8,5	82,	,846	,124	,722	70,3	11,6	10,6	75	..	..		ne.	se.	do	do
18	,976	,340	,636	68,4	6,0	6,0	90,	,879	,150	,729	70,5	5,9	5,5	94	..	..		n.	se.	do	do
19	,998	,350	,648	69,7	4,2	4,4	96,	,876	,084	,792	72,4	7,9	8,0	88	..	..		se.	se.	do	do
20	,9o6	,298	,658	70,3	3,3	3,9	97,	,806	,044	,762	73,5	6,2	5,4	92	..	..		W.	SW.	do	hazy.
21	,940	,174	,766	72,2	3,7	3,9	98,	,880	,198	,682	75,3	7,6	7,4	90	..	..		sw.	W.	do	clear.
22	30,024	,296	,728	72,7	4,1	4,2	98,	,950	,134	,816	74,4	7,1	6,4	94	..	..		sw.	SW.	clouds.	do
23	29,940	,422	,518	69,0	11,3	10,2	73,	,020	,224	,796	71,5	12,7	12,0	69	54,5	93,0		nw.	NW.	clear.	do
24	30,110	,558	,552	66,7	11,5	10,7	68,	,018	,332	,686	79,4	13,5	13,3	62	48,5	92,0		nw.	n.	do	do
25	,085	,484	,601	66,5	10,0	9,5	75,	,000	,324	,676	68,5	11,8	11,2	71	42,0	10o,5		N.	nw.	do	do
26	,148	,536	,612	66,7	9,5	8,8	79,	,042	,370	,672	68,8	12,4	12,1	68	43,6	102,1		nw.	n.	do	do
27	,158	,550	,608	66,5	7,3	6,7	84,	,024	,290	,734	69,9	11,9	11,8	73	45,7	107,2		w.	nw.	do	do
28	,099	,484	,615	65,7	7,2	7,7	83,	,982	,244	,738	70,3	13,5	14,0	66	48,0	108,4		W.	N.	do	do
29	,069	,433	,636	68,0	8,8	8,8	82,	,948	,180	,768	71,3	16,1	11,0	61	50,	98,8		nw.	nw.	do	do
30	,068	,428	,640	67,6	8,7	9,4	79,	,950	,198	,752	71,1	15,0	15,1	64	48,3	101,4		nw	nw.	do	do
31	,094	,449	,645	67,4	9,1	8,9	81,	,984	,24	,736	71,0	15,7	14,3	64	46,3	100,0		W.	W.	thick fog.	do
Mean,	29,997	,314	,683	67,8	8,0	7,6	84,	,908	,127	,781	70,7	11,5	10,6	74	..	..		northerly airs		clear-cold	weather.

The object of the present year's observations will be to shew what reliance may be placed on a Barometer, the tube of which has been wetted with well-boiled water before filling in the mercury. The instrument used has been registered for some months past. Comparison is also made of a differential thermometer for measuring the depression of temperature produced by evaporation, and the ordinary wet-bulb thermometer. The instruments used are the same as during the last year.

JOURNAL

OF

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I. – *Some Account of a Sect of Hindu Schismatics in Western India, calling themselves Rámsanèhí, or Friends of God. By Capt.* G. E. Westmacott, *Asst. to the Gov. Gen's Agent, N. E. Frontier.*

Of the Mahant or Religious Superiors of the Order.

Rámcharan, the founder of the Rámsanèhís, was a Rámávat Byrágí, born A. D. 1719*, at Sorahchasen, a village in the principality of Jypur. The precise period, nor the causes, which led him to abjure the religion of his fathers, do not appear: but he steadily denounced idol-worship, and suffered on this account great persecution from the Brahmans. On quitting the place of his nativity in 1750, he wandered over the country, and eventually repaired to Bhílwára, in the Udípur territory, where after a residence of two years, Bhím Singh, prince of that state, and father of the present Rána, was urged by the priests to harass him to a degree which compelled him to abandon the town.

The then chief of Sháhpura, who also bore the name of Bhím Singh, compassionating his misfortunes, offered the wanderer an asylum at his court, and prepared a suitable escort to attend him: the sage, while he availed himself of the courtesy, humbly excused himself from accepting the elephants and equipage sent for his conveyance, and arrived at Sháhpura on foot, in the year 1767; but he does not seem to have settled there permanently until two years later, from which time, it may be proper to date the institution of the sect. Rámcharan expired in the month of April, 1798, in the seventy-ninth year of his age, and his corpse was reduced to ashes in the great temple at Sháhpura.

* A. Samvat 1776.

Sadha Rám, Governor of Bhílwára, a Bania of the Deopura tribe, was one of Rámcharan's bitterest enemies: he on one occasion dispatched a Singí* to Sháhpura to put the schismatic to death; but the latter, who probably got information of his purpose, bent his head low as the man entered, and told him to perform the service on which he was deputed, but to remember that as the Almighty alone bestowed life, man could not destroy it, without the Divine permission. The hired assassin trembled at what he took for preternatural foresight in his intended victim, fell at his feet, and asked forgiveness.

Rámcharan composed 36,250 Sabd or hymns, each containing from five to eleven verses: thirty-two letters go to each aslok, which give the above total. He was succeeded in the spiritual directorship by Rámjan, one of his twelve Chèla or disciples. This person was born at the village of Sirsin, embraced the new doctrine in 1768, and died at Sháhpura in 1809, after a reign of 12 years, 2 months and 6 days. He composed 18,000 Sabd.

The third hierarch, Dulha Rám, became a Rámsanèhí, A. D. 1776, and died in 1824: he wrote ten thousand Sabd, and about four thousand sakí, or epic poems, in praise of men eminent for virtue not only of his own faith, but among Hindus, Muhammedans, and others.

Chatra Dás was converted at the early age of twelve years, ascended the throne† in 1824, and died in 1831. He is said to have written 1000 Sabd, but would not permit their being committed to paper.

Náráyan Dás, the fourth in descent from Rámcharan, now fills the chair of spiritual director.

On the demise of a Mahant, an assembly of the priests and laity is convened at Sháhpura to elect a successor, who is chosen with reference alone to his wisdom and virtues. He is installed on the thirteenth day after the office falls vacant, on which occasion the Byrágís entertain the entire Hindú population of the town with a banquet of sweetmeats at the temple within the city-walls, known by the name of Rammerí‡.

The only difference between the garb of the Mahant and that of the priests consists in the quality of the cloth, which is made of cotton of

* Singí. A particular cast of Hindus, so called in Rájwára from their conducting a number of their own, and of the Mahesrí and Suruogí tribes of Banias, to noted places of pilgrimage, free of all expence. The word is evidently a corruption from Sangí a companion.

† Gaddí is the term invariably applied to the cushion of the superior and Mahárâj (mighty prince), the only title by which he is addressed and spoken of by the Rámsanèhís. They approach him with profound obeisance, reverently touch his foot, and lay their foreheads to the marble on which he is seated.

‡ Merí signifies an upper-roomed house in the language of Rájwára.

rather a finer texture than theirs: their diet is the same, and consists of dry cakes of coarse wheat flour without any kind of seasoning. The superior resides at Sháhpura, the chief place of their religion, but occasionally leaves it for a period of one or two months, wandering over the country to mortify his body and accustom it to endure fatigue.

Religion.

The Rámsanèhís believe in the unity and omnipotence of God, whom they regard as the Author of creation, preservation, and destruction; nor so far as I could learn, do they hold his nature and attributes to differ materially from the doctrine professed by ourselves. They call the Supreme Being, Rám; he is the source of all good, and the averter of evil, and as none can fathom his decrees, resignation to them is implicitly enjoined. Man is pronounced incapable of any exertion of himself: whatever comes to pass is accomplished through the Divine Agency; and as God alone is the bestower of rewards and punishments, the Rámsanèhís are instructed to be constant in his worship, in the morning, at noon and night, and always to ask his blessing before going to meals. The soul is believed to be an emanation from the Divine spirit, which takes flight to heaven on the dissolution of the human frame; and they inculcate, if a person commit sin, who has enjoyed the advantages of education and is versed in the scriptures, no future act however exemplary can procure his remission from punishment, but in the case of an illiterate man, that he may by study, devotion and repentance obtain absolution of his crimes.

The formation and worship of idols is expressly prohibited. The Rámsanèhís pass the Hindu gods unnoticed, and no sort of images or symbols of idolatry are admitted into their temples. When I pointedly asked Náráyan Dás his opinion of idol-worship, he replied in verse:—'As to lave the body in the ocean is equivalent to bathing in all the rivers of earth, since they flow into the great deep; and to irrigate the roots of a tree is sufficient without further waste to nourish and bring forth its leaves, its flowers, and its fruits; so to worship the omnipotent God, does away the necessity of addressing all inferior deities.'

The Mahant said it was a mistake to suppose the doctrine of the sect was new—it had in fact existed in the world from a very remote period, though shorn of its purity by admixture with debasing superstitions and false tenets, engrafted upon it from time to time by the ignorant and designing. Men were born in every age who held sound principles of belief, but persecution compelled them to recant their opinions, or to take refuge in the wilds. It was reserved for

Rámcharan to frame a code from the most approved writings of Hindu law-givers: to avoid giving a shock to the prejudices of the people he desired to convert, he wisely took the Shástras for his guide, culling that which was good, and rejecting all that he deemed mischievous—and he called those who adopted his opinions Rámsanèhí, friends or servants of God.

The Mahant readily engaged to furnish me with a complete collection of their sacred writings; but as there was but one copy in the temple, I succeeded in bringing away with me only a few selections, of which I subjoin a translation. The head of each page is inscribed with the holy name of Rám, used by the society as an initial title of respect, corresponding with the Alif (Allah) of the Musalmans, and Srí of the Hindús, and signifying, that an author solicits the blessing of God on commencing a work, and invokes success on the undertaking.

The Mahant wrote the first Sabd in an elegant hand, the rest were transcribed by the priests in a corresponding style of beauty, and red ink-marks are introduced in the commencement and end of each couplet. The religious works of the Rámsanèhís are written in the Deva Nágarí character, and chiefly in the Hindí language, with an admixture of Rájwára provincialisms—but there are also a great many Sanskrit and some Panjabí verses, and Arabic and Persian words likewise find a place.

Of the Priests.

Priests are called either Byrágí or Sádh, and are divided into three classes, the two last of which, denominated Bedehí and Mohaní, I shall notice presently. They are enjoined to study the holy writings, and to disclaim all merit in their works: to observe celibacy, chastity, humility, abstinence, and contentment: to put a restraint upon the tongue: to sleep little: to accustom the body to hardships and fatigue: and to exercise charity, liberality, and mercy. Anger, brawls, avarice, selfishness, usury, gaming, lying, theft, lust, hypocrisy, and all kinds of luxuries are strongly denounced.

Priests are commanded never to look at their face in a glass, nor to use snuff, perfumes, or ornaments, as such things savour of vanity. To go bare-footed, and on no account to ride on any kind of conveyance: never to destroy any thing animate, nor to live in solitude, nor to ask or receive money. Dancing, music, and other frivolous amusements are forbidden, and to taste of tobacco, opium, and all intoxicating drugs and spirits.

They are not permitted to prepare medicines, but do not object to receive them in time of sickness at the hand of a stranger.

It may be right to mention in this place, that many of the reasons given for the institution of particular rites were received from the chief of the Rámsanèhís, to whom I made three visits: he usually delivered himself in Sanskrit verse, which he afterwards explained in the local dialect, for the instruction of his hearers.

It was a maxim of Rámcharan that woman and gold in the present vicious state of society were the principal sources of mischief in the world, he therefore enacted a strict ordinance for priests to shun both of them. The founder, a married man without a family, set the example of putting away his wife; and this sacrifice, with the desertion of one's children, are essential to obtain admission to the order: but the families of these Byrágís are, I believe, in all cases comfortably provided for. So strictly is the rule of continence enforced, that a priest is only permitted to converse with females on matters connected with religion; the smallest approach to levity would involve the dismissal of the culprit. Dulha Rám, the third Hierarch, was affianced at the time he became a Rámsanèhí, and of course broke troth and cast away the kangna or thread bound round a bridegroom's wrist; hence his name Dulha or the Bridegroom. A Turan*, representing a bunch of flowers in stone, is suspended under the porchway of his shrine at Sháhpura, in commemoration of the circumstance.

Gold is supposed to beget avarice, and to accept of it destroys the integrity of all previous acts of piety and virtue. I combatted its interdiction on the plea that the misuse, as of every thing else, was to be guarded against, but that it was capable of working much good —and inquired if women were thought so ill of, why the sect admitted female converts. "The touch of gold," said Náráyan Dás, "is a lure to sin, and marriage is prohibited to ecclesiastics (not to the laity), because the cares of a family would interfere materially with their holy meditations. The heart should be fixed on one alone (God), he who places his affections on any thing mortal, ceases to be a Byrágí." It is related, in example of the little value set on lucre by the Rámsanèhís, that a man presented Dulha Rám on some occasion with a philosopher's stone, which the sage received in silence and cast into a well. The author of the gift, indignant at the contempt shown to his offering, preferred a complaint to the Rája of Sháhpura, who asked the superior the motive of his conduct. The man having acknowledged he bestowed away the stone, the Mahant inquired how he could

* It is usual among Rájpúts of all ranks, at the time of a wedding, for the father of the bride to suspend a bunch of flowers made of silk or wood, called turan, at his porchway, which the bridegroom strikes with the handle of a whip or stick before he enters to bear away the bride.

in reason complain of the loss of what did not belong to him.—"Your motive," said Dulha Rám, "in presenting the stone was to tempt me to evil; but I covet not gold, nor is the transmutation of metals fitting employment for a mendicant: take ye twenty rupees and begone."

A Byrágí, convicted of receiving money, is branded on the forehead with a metal coin, heated for the purpose, and ejected from the community. Yet this interdiction, however strict, must be regarded as nominal, since lay followers receive money for the use of the order—and two Banias of the sect residing in Sháhpura are appointed expressly to receive remittances, lend out money, and carry on trade on account of the holy fraternity.

A woman may become a priestess, as in the instance of Sarúp, a devoted adherent of Rámcharan, by abandoning her husband and offspring, and by conforming strictly to chastity and other statutes. Females are forbidden under pain of chastisement and excommunication, to approach places of worship after dusk, as they form the residence of the priesthood: it is considered prudent to guard them from temptation, although they are supposed to have acquired absolute controul over the passions and all unlawful desires, before they are admitted to the sect. The sexes sit apart in the temples, and never sing together.

In regard of the injunction to sleep little, and to follow habits of industry, they say there is enough of sleep in the grave, life is evanescent, and of too much value to be passed in repose; and by wasting the precious hours in slumber, man degrades himself to an equality with the brute. Their aliment is poor, and taken sparingly, because abstinence induces watchfulness, while a surfeit of food and sleep make the soul heavy. Priests reside away from the habitations of man, as the turmoil of cities would interrupt their meditations; but they are at the same time commanded to live together, to correct the foibles and relieve the gloom of each other. "A solitary lamp," added the chief, "however brilliant, casteth a shadow beneath it—place another lamp in the apartment, and the darkness of both is dissipated."

The priest changes his name on admission to the order, to denote he enters on a new state of life, and the hair of his face and head (with exception to a small tuft on the crown) is shaved close; there are several barbers on the establishment, whose business it is to perform this office; they are wealthy, and receive occasionally valuable presents. I heard of a Charan, who, in a fit of liberality, presented five hundred rupees to one of them. The only covering worn by the Sádh is a cotton cloth, of coarse texture, seven feet and a half long, with a small piece for a waistband, and another for a percolater, water being always strained before it is used for culinary or other purposes, to guard

against the destruction of animalculæ. The sheet is coloured with Gírú, a kind of red-ochre, emblematical of humility; they add a second in the winter season, and sometimes a third, when if warmth be not obtained, they throw off all clothing, to mortify feeling, disdaining, as they express it, to be overcome by the wintry elements. This sheet is brought over the head, and forms its only covering; but woollen cloth of similar dimensions is sometimes substituted for cotton in the cold months. They all go bare-footed, and never ride on any description of animal or wheeled conveyance.

A perpendicular mark of white clay, called Sirí, imprinted on the forehead, is a distinguishing symbol of the sect, denoting belief in the unity of God, and they have a rosary of small beads used in prayer about their necks. Metal utensils are proscribed. The Sádh drink from wooden goblets, and eat off stone, china, and earthen-ware; the latter, it is well known, are forbidden to orthodox Hindus. They abstain from animal food, and what is singular, considering the extraordinary anxiety shewn to provide for the safety of insects, partake of nothing unsubdued by fire, fruits and vegetables not excepted. They have no objection to touch the element, but refrain from preparing their own food: thus it should seem, however fearful themselves, to incur the deadly sin of robbing a creature of life, they do not view the act in others with the same antipathy. Even the most loathsome vermin are held sacred; whenever a Rámsanèhí kindles a light, he covers it with a shade, and lamps are excluded from the temples from an apprehension they may lure insects to destruction. Influenced by a similar feeling, the priests look on the ground before they walk, and never move out of doors, except on very urgent business, during four months of the year, or from the middle of Asarh* to the middle of Kartik. The insect population being most active in the wet months, they fear to crush them under foot in passing through the rank vegetation, and should they be on a journey, halt without reference to situation, till the season is over.

The total number of Sádh, so far as I could ascertain from inquiry in various quarters, does not exceed eight hundred. No census has ever been taken: they are dispersed over the country frequently at a great distance from Sháhpura, and never attend the festival of Phúl Dol together, so it is obviously impossible to arrive at a correct estimate. The number at Sháhpura constantly varies, and about a hundred are sometimes met with in the temple at one time; the visitors who come to make their respects to the superior, to consult him and receive his blessing, usually remain for three days, and give place to others.

* July, August, September, and October.

The priests may be considered wealthy, their few wants considered, and the laity subscribe liberally to their support. Two of them visit the town of Sháhpura daily, to collect ready-dressed victuals from lay members of the community and Hindus of the better class, who contribute readily to fill their wallets. They do not accept food from other sects, and the custom is observed, it should seem, as an act of humility, certainly not from an avaricious motive. The fraternity make their evening repast off these offerings, and purchase materials for a simple breakfast, the only other meal, out of their own coffers.

Rámcharan had twelve pupils or disciples, called Chèla, whom he selected from the priesthood, filling up vacancies as they occurred, from the most virtuous of the elders, and this custom is continued by his successors. They are called the "Baruh Thumbe ke Sadh," or disciples of the twelve pillars. The middle hall of the temple where the Mahant sits, and prayers are read, being supported by that number of columns, three on a side, beneath which the disciples range themselves. The openings between the columns are hung with cotton cloths, dyed with Gírú, let down at night to exclude the air, and here the priests take their repose; the pavement of the hall is elevated above the outer terrace, and is the only part of the structure laid with mats, and dry grass is spread upon the terrace in the winter, the only time of year such a luxury is permitted, to serve as a cushion to the laity and visiters who are not admitted inside.

The twelve do not reside permanently at Sháhpura, but four or five are always found there at one time. One of them denominated Kotwal acts as steward of the grain and medicines deposited in the temple, and distributes a daily allowance of food to the inmates; nothing can be taken from the store without the Mahant's order; it is also the duty of the Kotwal to summon the priests to midnight prayer.

Another of the body called Kapradár—keeper of the wardrobe—has charge of various kinds of clothes presented by the laity and strangers for the use of the brotherhood: these include coarse cottons, blankets, and other woollens, but no coloured or rich stuffs are accepted. The cloths supply the Sádh with raiment, and when cast off, are bestowed in charity; and some of the brotherhood are constantly employed preparing dresses for the poor. The same individual keeps the vessels of the refectory.

A third fills the office of censor, and maintains strict watch over the manners and moral conduct of the fraternity. A fourth teaches the priesthood to read, and a fifth instructs them in writing.

Another is appointed to teach reading and writing to men of all persuasions who apply to him, while a seventh, usually selected for his

age and saturnine temper, instructs females in the same acquirements.

The remaining five, with three disciples chosen indifferently from among those mentioned above, form a council of eight, appointed by the Mahant, to investigate into offences and infringements of the rules of the order. The elder ecclesiastics have usually several disciples, who are byrágís, and in event of the absence of a member filling an office in the establishment at Sháhpura, a trust-worthy follower officiates as his deputy.

Of the Priests called Bedehí and Móhaní.

Bedehí, compounded of two words *be*, without, and *deh*, body, implies that the persons so denominated are dead to all corporeal feeling, and accordingly they go stark naked.

The Mohaní, as the term indicates, feign insensibility and unconsciousness of all that passes around them. Priests who have not sufficient command over their tongues become "Mohaní," not for life, but a period of years; and when they have brought their hasty tempers into complete subjection, they resume the use of speech. They repeat "Rám, Rám," the watch-word of the sect, in acknowledgment of a salutation, and permit themselves to converse and answer questions on subjects strictly confined to their religion. With exception to the particulars noted, the Bedehí and Mohaní differ in no respect from the other priests.

The hungry, be their creed what it may, are never sent away empty from the temple, and the ragged are provided with suitable raiment. During Chyt, Bysakh, and Jeth, or from the middle of March to the middle of June, the hottest period of the year, the mahant stations a brahman*, with water-carriers at a distance of two miles from Sháhpura, on the different roads leading to the city, to minister to the wants of the thirsty traveller. And all the cattle of the town receive a certain allowance of fodder and water during the above season from the same bountiful source.

It will be seen, that the doctrine of the Rámsanèhís inculcates the mortification of the passions, with entire abstraction from the world, and the renunciation of all its pleasures and enjoyments. The two sins held in most abhorrence are incontinence and avarice, and are never forgiven. The dress of the priesthood is kept scrupulously neat and clean, and changed, I believe, every day, or second day, and

* It is barely necessary to mention, that a brahman is chosen, because Hindus of inferior caste, and I might include foreigners, are gratified to accept the beverage from his hand, while they might hesitate to take it from a man of low tribe.

their modest quaker-like demeanour, as they respond "Rám, Rám" to the salutation of the traveller, prepossesses him strongly in their favour.

Of the Laity.

The laity, known by the general name of girhist, are at liberty at any time to enter the hierarchy, and the office of mahant is open to them. They are particularly enjoined to speak the truth; to be constant in their affections, and just and honest in their dealings. I omitted to inquire, if females are forbidden to become Satí, but rather think they are not, as two of the wives of the late Rájá of Sháhpura, who was a Rámsanèhí, burnt in 1825. It might be that the force of ancient custom was in this case too strong to be overcome, and the noble often indulge licenses which would not be countenanced in the peasant.

The girhist celebrate their weddings with none of the pomp and rejoicing usual with the brahmanical Hindus, but conduct the ceremonial in a quiet unobtrusive manner. Like the byrágís, they are forbidden to mourn for the dead, as an act answering no purpose, since death is the doom of all, and also because it implies a want of resignation to the divine will. They burn their dead, and chaunt Sabd over a corpse.

Neither priests nor laymen observe Tíja, Dashahra, Dewálí, Holí, nor any other Hindu festival, that I am aware of; they keep a strict fast from sun-set until sun-rise, nor even when sick, are they permitted to take any nourishment, but medicine during those hours.

The laity at Sháhpura are in number about two hundred, of which perhaps a hundred and twenty are of the male sex, and they are interdicted turning Bedehí and Mohaní, as attention to the rules of those orders are incompatible with the discharge of temporal duties.

Converts.

The Rámsanèhís are composed of all castes of Hindus, and although no members of other sects have been converted, nor so far as I could learn, have any applied for admission to the order, the tenets are characterised by so much of liberality that I see nothing to oppose it. Both Christians and Muhammadans are freely admitted to their places of worship; all that is required of them, being to remove their shoes: but in the matter of diet, the force of prejudice and ancient custom are so strong among the sectaries, that I doubt if they would allow apostates of any other faith to eat with them.

Converts can be admitted to the society by the superior alone in the temple at Sháhpura, and they are conducted for this purpose by the priests from different parts of India. The superior makes the novice over on his arrival to the twelve Sádh of the pillars, who are

directed to examine him on the soundness of his belief, and to make him thoroughly conversant with the tenets on which their religion is founded. Should their report be favourable, the name of the convert is changed, supposing he enter the hierarchy, but not otherwise, and he is received into the order, after undergoing a novitiate of forty days.

Some brahmans have enrolled themselves, but converts have been made principally from the mahèsrí* and agarval tribes of baneas. There are no certain accounts of the number of Rámsanèhís dispersed over Western India; they abound chiefly in Rajwára and Gujarát, are met with in the neighbourhood of most large cities and towns, such as Bombay, Surat, Hydrabad, Punah, and Ahmedabad, and there are some at Benáres.

When we consider the strict rules by which the ecclesiastics are bound, and the hardships by which they are expected to subdue the body, it is not surprising their number should augment but slowly; but the superior assured me, they had much increased of late years through the quiet which Western India enjoys under British protection.

Worship.

Worship is performed three times a day, but the laity, busied in their worldly avocations, do not all go at one hour, though once seated, they remain in the temple till the service is over. The book of prayer is always read aloud by a layman, who makes a pause at the end of every second or third verse, to enable the mahant, and in other tabernacles, a priest of superior acumen, to expound and comment on the texts in the dialect of the country. Not more than six or seven Sabd are read in a day, and continued concordant to order, until the whole have been explained to the congregation; thus two years are frequently occupied in going through the sacred writings.

The Sádh rise at midnight, and continue at their devotions until the first watch of the morning (8 A. M.), when the laity attend for a couple of hours, and the service concludes with a couple of Sabd or songs of praise chaunted by females. Mid-day prayer commences at one or two P. M., and lasts for several hours; and evening service, at which only men are present, begins at dusk, and terminates in an hour, during which time, two arthí or hymns, are sung. As observed in another place, men and women never sing together, and they sit apart in the temples; and when the priests are alone, they pass hours together in silent abstraction, and at other times, count their beads, repeating at intervals the holy name of Rám.

* Mahèsrí from Mahèsvar, a name of Mahádèva: both tribes worship the god under different energies.

Festival of Phúl Dol.

Annually in the month Phálgún*, a festival called Phúl-dol, is observed at Sháhpura, attended by as many of the priests and laity as are within reasonable distance: the Sádh rarely allow two seasons to pass in succession without attending. The five or six last days in Phálgún are, strictly speaking, the festival, but people begin to assemble upwards of a month earlier from distant parts of India.

The name of the festival, signifying "Flowers swinging" is borrowed I understand from one of the eighteen Puráns called Srímath Bhágavat, which contains an account of Krishna, and is intended more particularly for the instruction of his followers. A festival is annually observed in Bengal, and probably in other parts of Hindustan, by the worshippers of the god on the full moon of Chyt or Bysakh, when he is encircled with wreaths of flowers, placed in a sort of cradle, and swung by his votaries. I obtained no satisfactory reason why the Rámsanèhís, who do not observe the rite alluded to, should give the name of Phúl-dol to their great annual meeting.

Two or three Sádh reside in every village of consideration, and from eight to twelve, and upwards, in each city and large town, according to its populousness: they are always relieved at the Phúl-dol, a regulation framed by DULHA RÁM, the third mahant, to prevent their forming friendships and improper connections with the inhabitants: on no account are they permitted to remain for two successive years at one place.

Each of the princes of Udípur, Jodhpur, Jypur, Kotah, Búndí and of some of the smaller Rajput states, although orthodox Hindus, to evince their respect for the Rámsanèhís, send from eight to twelve hundred rupees to Sháhpura on the anniversary of Phúl-dol, to furnish forth a day's entertainment of sweetmeats to the sect.

Besides the Rám-dwára or temple outside Sháhpura, there is another religious edifice within the city wall, called Rám-merí, which has an establishment of five brahman cooks, five females to grind meal, and a similar number of water-carriers for the service of the brotherhood. Hither the high priest resorts with a few of the most pious of the Sádh, on the last day of each month, to keep a solemn vigil during the night, in commemoration of the death of RÁMCHARAN. Prayers are offered up, and the holy writings expounded, and respectable people of all persuasions are admitted to the building. The priests distribute sweetmeats and food collected in the town to the congregation, reserving their own share till morning.

* February, March.

Punishment.

When any member of the community infringes a rule, he is brought to Sháhpura, at the festival of Phúl-dol, by some one of the byrágís, who, as already mentioned, are dispersed over the country to watch the conduct of the sect. He is not permitted to eat with the brotherhood, nor to enter the holy edifice; but seated at a little distance off under a certain tamarind tree, where his food is sent to him on a platter of dhák* leaves. The offence with which he is charged is investigated by the council of eight, who make a report on it to the high priest. If found guilty, the culprit is deprived of his rosary, a barber of the establishment shaves the top-knot off his head, and he is ejected from the community. What is stated above applies to grievous offences. Slight infringements of order are investigated at all seasons; and sometimes when the culprit happens to be a long distance off, the priest stationed at the place takes a deposition of the case, and transmits it to the mahant, when if considered fit, he excommunicates the culprit, without ordering him to Sháhpura. It will be seen, the superior and council are a check upon each other, and they must coincide in opinion before a sentence can be carried into effect.

Religious Edifices.

Temples of the Rámsanèhís are known under the name of Rámdwára, or the gate of God. Among other places in Rajwára, where they are met with, may be enumerated Jypur, Jodphur, Mertha, Nagor, Udypur, Chittor, Bhílwára, Tonk, Búndí, and Kotah. The one at Sháhpura is by a great deal the handsomest, and distinguished for the richness and magnificence of its architecture: it is built of rock quarried at Katí, a distance of twenty-four miles, and coated with brilliant white chunam, formed of the same stone, reduced to powder and mixed with milk and other ingredients, which adapt it to receive a high polish. The entrance porch faces the east, and is very lofty, with an arched balcony above, and like other parts of the buildings, neatly carved. From the centre of the pile, a handsome pavilion, with open arches, rises far above the other towers; and in a vault beneath, the corpse of the founder of the sect was reduced to ashes. Between the vault and pavilion, there is an equilateral apartment, supported on twelve pillars, connected by scolloped arches: this was the favourite abode of RÁMCHARAN, and here the mahant daily takes his seat, to expound the doctrines of the faith, and the congregation assemble on the terrace without, for morning and evening prayer.

On the south face of the temple, but quite separate from it, stands a range of seven domes, to which you ascend by steps, six of them re-

* Butea frondosa.

pose on twelve pillars, and correspond exactly in their proportions: three are built over the ashes of the Spiritual Fathers, who succeeded the founder, and the others cover a similar number of venerated priests of the community. The central or seventh dome has only five columns, and is much smaller than the rest; it marks the spot where the remains of a female named SARU'P, a pious disciple of RÁMCHARAN, were burnt; and the domes, with those of the temple, are painted inside and out in ornaments of vivid colours. The Rám-dwára was built at different periods, when funds were available, and is said to have cost about eighty thousand rupees: it is kept remarkably clean, and presents a unique and handsome appearance, essentially differing in design from all Hindu edifices I have seen. On a level with the vault are apartments for the priests and members of the sect, who resort to Sháhpura at the festival of Phúl-dol, and here are also the stores of linen and blankets belonging to the fraternity.

Behind the Rám-dwára repose the ashes of the ancient Rájas of Sháhpura, each in a distinct shrine. BHI'M SINGH, grandsire of the reigning chief, was the patron of RÁMCHARAN, and was the first of his family who embraced the new doctrines. The late Rájá died at Udypur in 1825, but his turban was transmitted to Sháhpura, and with it two of his wives performed Satí.

**Selected Translations from the Religious Writings of the Rámsanèhís.*

1.—The name of RA'MA is the real seed, in which all things are contained: for he is the source of the three qualities (of goodness, passion, and darkness); of the fourteen regions (of Hindu cosmogony); of the twenty-four (incarnations); the three hundred and thirty millions (of Hindu deities); and the three (principal Gods, viz. BRAHMA, VISHNU, and MAHESWARA), who should be adored, and who not? RA'MCHARAN says, the whole universe sprung from that only seed, as leaves shoot forth and fall off in abundance from the same tree.

2.—The person who adores the all-pervading RA'MA, and turns his back upon the other gods; who visits his guru with bare feet, and stretches forth his liberal hand; who has renounced the world, neither uses harsh language nor jokes, and seeks not any pleasure; who giving up all considerations on profit and loss, resigns himself to the will of HARI†; who is not addicted to gaming, stealing, avarice, lying, and hypocrisy; who does not taste bhang‡, tobacco, opium,

* I have to acknowledge my obligations to Bábu KA'SI PRASHA'D GHOS of Calcutta, for his courtesy in assisting me with a translation of these papers: he purposely rendered it as literal as possible, and I am not sure if it would not have been better had I left it in that form.

† A name of VISHNU, but employed here and elsewhere along with RA'MA, to express God in an abstracted sense; the frequent mention of these two as objects of worship, is owing to the doctrine of the Rámsanèhís being mixed up with the tenets, and these verses being selections from the books, of other Hindu sects.

‡ An intoxicating potion, prepared from the hemp plant (Canabis Sativa).

akhaz and wine; who drinks water after straining it, and looks before he walks, is the true Rámsanèhí who hath attained his purpose.

3.— RA'MA is the sea of happiness and destroyer of misery—abandon him not, O RA'MCHARAN, but be constant in his worship.

Song in the Pánjábí language.

The faqír who is enamoured of the beauty of the All-Merciful is drowsy throughout the eight prahars*, because he is fully intoxicated with his love. He (or his spirit) has come from an inaccessible region, and entered the corporeal frame, and after having witnessed all the troubles of the world will return to that region. As long as He (or the soul) occupies the serai (*i. e.* mansion of the body), he gives its proper rent (*i. e.* discharges the duties of humanity) and abandoning his desires, resigns himself to the will of his deity. He wanders about at ease, forms no attachments, seeks only his beloved (God), and bestows a portion (of bread or any other thing) upon all who need it. He points out the path to heaven, rescues others from perdition, conforms to the duties of this world with his faith, and is influenced by no private motive. RA'MCHARAN says, that few individuals have followed the example of such a faqír, who gives no thought to the world, but is content with his present condition.

2nd Song in the Panjábí language.

The faqír whose heart is firm (in God) is above all amírs†; for he is a true pír‡. Knowing that the body is a hell, he places not his affections on the world, and keeps aloof from it by frequently meditating on the Alif of Allah. Restraining his heart from going astray, he has laid it at the feet of the Almighty, and remembers him at dawn, in the morning, at noon-time, and evening. He absolves himself in the water of faith, and tells the beads of fatwa§. His cave is in the sky (*i. e.* abstraction of mind), where he sits in contemplation. RA'MCHARAN says, that people do not understand the secret motive of such a faqír, which is to obtain the indescribable Being‖ in his body, whom he always serves.

4.—The darvèsh is always happy who is free from desire. Either remain at one place, or roam about in the four quarters (of the earth): roam about in the four quarters, and labour for the salvation of your soul. Be awake or asleep, but entertain no selfish motive. Let your hair grow as long as was that of *Sahaka* and others, or shave your head bare: for he who is free from desire is always happy. Practise benevolence, and make your heart as pure and soft as wax, and look down upon your feet. Be patient, speak the truth, and dance without a mistake (*i. e.* discharge your duties properly). Having once placed the hand of your spiritual guide upon your head, never be so shameless as to undress yourself (*i. e.* refrain from all intercourse with women). He has subdued his mind and heart, and taken his seat in perseverance. RA'MCHARAN says, this is the height of devotion, as a person who attains it has cooled (subdued) his Pir (senses), and never covets the society of women. He is not given to intoxication, love, or adultery, but is always engaged in contemplation, and from leading a solitary life, his mind is free from all affection.

* An eighth part of the twenty-four hours.

† A chief or grandee.

‡ A saint, or spiritual father.

§ Divine knowledge.

‖ The human soul is believed to be a portion of the Supreme spirit, and consequently worshipped as such.

5.—If having fed yourself through the charity of mankind you sleep at ease, with outstretched limbs, and fail to offer worship to HARÍ, the punishments of Yama* will not be mitigated: do not take thy meals without adoring the lord supporter RA'MA, but abandoning thy habits of idleness, worship him day and night. Abandon thy habits of idleness, and walk not without the fear of God. If you neglect to follow (this advice), you are a hypocrite, and shall be doomed to pass through the eighty-four (transmigrations). As a powerful creditor collects his dues from his weak debtors by severe beating, so shall you be punished if you take your food without adoring RA'MA.

6.—The ignorant person who commits a sin becomes free from it by the acquisition of knowledge, but the man of knowledge, who is guilty of vice, is like a newly varnished pot, from which the dust (should any fall upon it) never goes off. He is like a newly varnished pot from which the dust never goes off, or like a blue stain (upon linen). A sin committed at a holy place of pilgrimage is like a waking dream. As the stupid man who mistakes his way in the day-time can never discover the true path at night, so the person who possessed of knowledge perpetrates a sin can never emancipate himself from it.

7.—He is a real faqír who makes the stone his bed, whose tent is the sky, whose arms are his pillows, and who eats his food from earthen vessels: he is the master of the four quarters, and is not regarded as low. The prince and the peasant fall prostrate at his feet, and he subsists by begging.

8.—You must die one day, whether you live in the city or the wilderness†. Some (*i. e.* the wicked) are taken bound in chains, while others (*i. e.* the good) are summoned (by death). They are sent for who have renounced the world, who have none to weep (for them), and who have always taken the name 'RA'MA.' RA'MCHARAN says, the good abandon their homes, because they know that they must one day perish, whether they inhabit the city or the wilds.

We should mourn over the corpses of the dead, if weeping could restore them to life. If doctors could save mankind, then none of the wealthy would die, but it is not in the power of any to escape death. Enquire of this from place to place, and weigh it thoroughly in your mind. Life and death were created by the Lord, who can do whatsoever he willeth. We should mourn over the corpses of the dead, if they could be restored to life by weeping. You blame RA'MA, and cry:—"Oh RA'MA, what have you done, who will support my family, and who will superintend my household works? What have you done, Oh RA'MA? you have as it were sunk the vessel in the middle of the stream." You know not how long you may live, and RA'MCHARAN declares without this knowledge you fall off from HARÍ', because you blame RA'MA, and exclaim, 'Oh RA'MA, what have you done?'

‡9.—You may have followers, eloquence, and fame, without using any exertion to obtain them; you cannot therefore fathom the will of RA'MA. I look not for means; every thing comes to pass of its own accord. The will of HARÍ is powerful, who can revert it? Whatever happens is accomplished by RA'MA; for I am incapable of performing any thing, it is the very height of folly.

* The Indian Pluto, and king of Patal or hell.

† Meaning the souls of those persons.

‡ The figures correspond with the number of paragraphs in the MS. selections.

2nd Leaf.

1.—Man clad in scented garments walks forth with conceited strides, but while all in his outward appearance is fair, his inside is corrupt. He views his features in the glass, and is puffed up with pride; but is ignorant, that his body will suffer dissolution at last, and that not even the fair skin (which now) covers the filthiness within him, will remain.

2.—Woman and the objects (met with in this world) persuade the heart to terrestrial enjoyments, and often level the most exalted mind; such is their nature, therefore abandon them, Oh RA'MCHARAN! You can obtain nothing, Oh RA'MCHARAN, in this world without money, but to an ascetic money is nothing. To an ascetic money is as worthless as a kowri shell; it destroys devotion, knowledge, and ascetism; it ruins devotion, knowledge, and ascetism; for it increases the appetites and eats up (*i. e.* destroys) the integrity of those three qualities. Like achavan*, it absorbs every virtue; wherefore an ascetic sets no value upon money.

3.—The body is the shrine of which the all-perfect RA'MA is the god; the anxiety (to see him) is the artí†, and to remember him is true devotion. No worship is better than the constant remembrance of him, and no offering is more proper than resignation. Leave your heart's individuality (or pride), and God will listen to your adoration. He is quite content, Oh RA'MCHARAN, who has understood this secret truth, that the body is the shrine of which the all-perfect RA'MA is the god. Destroying your works (*i. e.* abandoning the merit of them hereafter), enjoy the sweets of humility, contentment, charity, and peace. Speak the truth, curb your inclination and your tongue, repeat the name (RA'MA) inwardly, and acquire divine knowledge. Give up your desires, sit down contented, retire to the woods, and immerse yourself in the pleasant ocean (of contemplation). The faqír who has drunk of the love (of God) constantly meditates on him, his aspirations and respirations are not in vain; for whether awake or asleep, he never forgets his God. He is merciful, subdues his anger, and neither indulges in avarice or delusion: he worships none but RA'MA, and cares not if the remaining three hundred and thirty millions of gods are displeased with him.

4.—The ascetic is always awake, and meditates himself, and makes others meditate (on God). Whenever slumber comes upon him, he sings a hymn —whenever he lights a lamp, he thinks of the safety of animals, and covers it either with abhra or cloth; by this means, the followers (of this doctrine) never incur guilt, but attain virtue. CHÍTAN says, that many have obtained salvation by avoiding desire, and disclaiming all merit in their works.

5.—What will you achieve in lying, oh KABÍR?—lying will bring on sleep while death is near the pillow, like the bridegroom at the turan. What will you achieve in sleeping, oh KABÍR?—awake and meditate upon Maráníţ, for you must sleep one day with your long legs outstretched. What will you accomplish in sleeping, oh KABÍR; strive to keep yourself awake, for this life is as valuable as a diamond or ruby, and should be given up to (meditation on) the Lord. What

* The ceremony of sipping water before eating.

† The ceremony of turning a light about the face of an idol.

‡ A name of Krishna.

will you accomplish in lying, oh KABÍR? Arise and sorrow for nothing—how can he whose abode is in the grave (*i. e.* who reflects on the evanescence of this life) —(how can he) sleep in quiet?

6.—By adoring RA'MA, the state of Brahm is attained; this has been fully proved by his votaries. Let, therefore, all the Rámsanèhís meet together, and raise a halelujah to RA'MA.

7—Should the devotee go forth in the autumn, and trampling upon the numerous animals which are born at that season, occasion their death, he forfeits his innocence, inasmuch as he destroys the feelings of his heart, and thereby commits sin at every instant. TULSI says, this is not devotion either in mind, deed, or speech, but the devotee who is careful to remain quietly at home observes the rules of virtue.

(These verses are dated Tuesday, the 6th day of *Chait*, in the *Samvat* year 1855 (A. D. 1798), the year of RÁMCHARAN's decease.)

II.—*Journal of a Tour through the Island of Rambree, with a Geological Sketch of the Country, and Brief Account of the Customs, &c. of its Inhabitants. By Lieut.* WM. FOLEY. *With a map, Plate* iv.

(Continued from page 39.)

January 15*th.*—It had been my intention to cross over *Jeeka*, and proceed from thence towards the town of *Rambree*, through the *Northern Hong**. My host of *Oogah*, and the guides he had furnished me with, were, however, so fearful of accident, and unwilling that I should incur any risk by passing over this wild and almost inaccessible part of the island, that I abandoned the design, and consented to be taken along the sea-shore to the south-west of the mountain, with the view of putting up at *Singhunnéthe*, a village in the *Southern Hong*. I afterwards discovered that had the day been any other than what it was, (Wednesday,) I might have succeeded in inducing the guides to take me over Mount *Jeeka*. The *Mughs* pay a superstitious deference to what are termed the fortunate and unlucky days for any undertaking. Wednesday (*Boduh-hoo*), happened to be among the latter number. *Pyatho* (January), is held to be a very unfavourable season for building a house, and marriages are never celebrated in the months† *Wajho*, *Wagoung*, *Todelin* and *Tsadinkyot*. I left *Oogah* by the sea-beach, and passing a few sandstone rocks, with an island resembling the *knot* in appearance and structure, found myself at the foot of *Jeeka*. Its elevation above the sea is probably as much as 3000 feet; the very abrupt manner in which it rises above the range with which it is connected, gives it, at a dis-

* *Hong* is one of the circles in the island; there are two *Hongs*, (*North* and *South*.)

† July, August, September and October.

tance, the aspect of an isolated hill. A dense forest, with little variety of shade, covers the mountain from top to bottom. The ground on the summit is said to be level and clear, but it remains uncultivated, as no *Mugh* will fix his habitation in a spot which not only abounds with wild beasts*, but is, in his opinion, the abode of fairies, and evil spirits, equally destructive with the former. I observed the prints of elephants' and tigers' feet in several places on the road, and from the diminutive size of some of the prints, it was evident that these animals had been accompanied by their young. The guides remarked that a herd of elephants may frequently be seen during the evening feeding upon the long grass and underwood at the foot of the mountain. By their account, the elephants were particularly troublesome in the months of *October* and *November*, (when the rice crops are becoming ripe,) at which time they descend into the plains and do a great deal of mischief. Although elephants are continually shot in the Sandoway district for their teeth, no attempt has yet been made to catch or destroy the elephants on Mount *Jeeka* and its neighbourhood, from the absurd opinion entertained by the inhabitants, that they are not only invulnerable, but are endowed with such superior sagacity as to render all endeavours to ensnare them futile.

I had hoped to find in *Jeeka* some departure from what had hitherto been the prevailing character of the formations on this side of the island. The almost impervious nature of the jungle at the base of the mountain, and the great danger that I should have incurred in endeavouring to ascend the hill on a quarter hitherto undisturbed by man, obliged me to confine my observations to the ground over which my path lay, and there I could find no one geological feature distinct from what I had already met with. A brown ferruginous sandstone regularly stratified, with an inclination to the south-west, was the only rock visible on the surface; whether the sandstone appears on the summit of the mountain, or is succeeded by some other rock, I was unable to ascertain; but so anxious am I to satisfy myself on this point, and to view the *Fairy Land* above, that I shall take an early opportunity of renewing my visit to *Jeeka*. At a little distance beyond the mountain, and at the foot of a small range bounded by the sea, stratification of the sandstone is beautifully distinct. The several layers rise from under each other for a considerable extent; exhibiting a similarity of appearance with the sandstone that covers the lignite coal of *Phooringooé*, an island to the east of *Combermere Bay*.

* Among these, are the *elephant*, the *tiger*, and the *bison*; I have in my possession a horn of the last mentioned animal, which measures 1½ feet in circumference. I only wait for an opportunity to present it to the Society.

Turning to the eastward over a few small hills intersected by ravines and covered wirh jungle, the road leads to *Rambreengheh**, *Kyout-nemo* and *Singhunnethe*. I observed some very beautiful creepers as I passed over these hills. The leaves, which were very small and delicate, were of a pink colour, and at a distance had the appearance of clusters of lilac blossoms. Of the animal tribe I saw nothing deserving of notice, save a solitary *Ghi* and a flying squirrel; (termed *Tshen* by the *Mughs*.) It is a very handsome creature, and larger than the squirrel of Europe. The head, back, and tail are covered with a rich coat of dark-brown fur; the under part of the chin, neck, belly and legs being of a bright yellow colour. The skin about the sides and forelegs is loose, and capable of being so much extended, that in making its prodigious spring from tree to tree it appears rather to fly than leap. It is said to be very destructive to gardens; if taken young it may be rendered perfectly tame.

Entering upon the plain, the village of *Rambreengheh*, with its surrounding hills covered with gardens of plantain trees, meets the traveller's view. A few well built *Kioums* are seen resting upon the side of these hills, which are, in some instances, crowned with glittering temples built over the ashes of the departed priests. The village is large and remarkably neat. The soil in its vicinity, a rich yellow clay, taken up with plots of indigo, tobacco, and pepper plants. Bricks manufactured from this clay, and reserved for the erection of temples, were piled up in several places outside the village. Beyond *Rambreengheh*, and to the right of my path, lay the large village of *Kyouk-nemo*†, almost concealed from view by the forest of plantain trees with which it is surrounded. *Kyouk-nemo* is accessible to the sea by a large creek, and was at one time much infested with dacoits; through the exertions of the magistrate at *Rambree* the reign of terror is now at an end, and the village is apparently in a thriving condition. Approaching the creek, which is at some little distance from *Kyouk-nemo*, I was fortunate in finding two *Godoohs* with their small boats at anchor; otherwise as there is no ferry at this place, I must have gone round much out of my way; the merchants kindly consented to take me and my followers over for a small consideration, and the mahouts prepared to swim their elephants across. The shore on the opposite side consisted of a deep clay, which made the progress of the elephants after landing a matter of considerable difficulty. So heavy was the soil, that I was unable to make my way through it unassisted by the boatmen, who in

* *Little Rambree:* it resembles not a little the town of *Rambree*, and thence its name.

† *Red stones.* I saw none of them in my path.

their turn depended for support upon the young mangroves and other marine plants that grew upon it. After some little exertion both elephants and men succeeded in reaching the *Terra Firma* of a stubble field. I here met the *Soogree* of the district, who had in some way been apprized of my arrival, and came out for the purpose of conducting me to the village of *Singhunnethe*. It was at no great distance from the creek, so that I was soon there, and in possession of the house that had been allotted for my accommodation. *Singhunnethe*, as was the case with all the villages that I had seen on the southern side of the island, is surrounded with plantain trees, which not only afford a wholesome and favourite article of food, but are in constant request for the production of a solution of potash* used in the preparation of dyes, more especially in those derived from indigo. The mode in which the potash is obtained from the plantain trees is similar to that followed in other parts of the world in its extraction from the different vegetable substances that produce it, with this exception, that it is held in solution by the water, which is not suffered to evaporate. The stem and branches of the plantain tree are divested of the outer rind, and then broken up into small pieces, which are laid upon the fire and slowly consumed; the ashes are lixiviated with water which is strained off, and reserved for mixture with the dyes. In front of the *Soogree's* house, and in the centre of the village, a nice tank had been dug; the only one I had hitherto met with, tanks being seldom seen except in the neighbourhood of large towns. The houses were neat and built with more attention to comfort and order than is general in the villages of *Rambree*. I remarked a hideous representation of the human countenance drawn with lime upon several of the door-posts. I was told, it is put up to deter the *demon of sickness* from entering the dwelling. Much sickness had been experienced of late, and this was one of the many absurd customs resorted to, with the view of ridding the neighbourhood of its presence. I further learned that when any one of a family has been a long time sick, and recovery appears doubtful, the inmates of the house assemble and make a tremendous noise with drums and gongs, at the same time beating the roof and walls with sticks to expel the evil spirit who is supposed to have taken possession of the dwelling. One door alone is left open for his escape, all the others being closed. While this is going on a *Phoon-*

* During the time that Government held the monopoly of salt in Arracan, the plantain trees frequently afforded to the poor a substitute for the common sea salt. So strictly were the Government rights protected, that a poor woman was actually prosecuted in one of the courts for collecting a little sea salt off a rock on which it had been deposited on the evaporation of the water left by the tide!

gree stands upon the road, opposite to the house, reading a portion of the *Khubbo-wah*, a book that is held in particular veneration. A further ceremony is sometimes observed by the invalid as an additional security for a complete restoration to health ; but it is only performed by those who feel themselves, as it is termed, *possessed*, and called to the exercise of the duty required of them, as a propitiatory sacrifice to the malignant spirit from whose ill will their sickness is supposed to originate. This ceremony, which is called *Nâth-Kadéy*, very much reminds me of the antics played by the dancing Dervises of old. A brass dish, or any piece of metal highly burnished, is put up in a frame, and in front of this are laid offerings of fruit, flowers, and sweetmeats. When every thing has been properly arranged, the invalid commences dancing, throwing the body into the most ludicrous attitudes; and pretending to see the object of worship reflected upon the plate of metal makes still greater exertions, until the limbs are overpowered, and the dancer sinks exhausted upon the ground. Should the sick person be so weak as to render such assistance necessary, he, (or she,) is supported by a friend placed on each side during the whole of the ceremony. It is by no means improbable that this violent exertion has on many occasions proved highly beneficial, realizing the most sanguine expectations of the people. In cases of ague or rheumatism, where a profuse perspiration, and a more general circulation of the blood throughout the human frame is required, there is perhaps no other mode of treatment more likely to produce the desired effect; and could some proper substitute be found for a piece of metal, the *Nâth-Kadéy* might be introduced with advantage into our own hospitals.

Superstition, the companion of ignorance, is a part and parcel of this benighted land. Was I to credit all that is said of ghosts and goblins, it would appear wonderful how this poor people contrived to pass through life unscathed. Every tree or rock that has any singularity of appearance is said to be the nightly residence of some hob-goblin or departed spirit. Yet with all this absurdity, some of the opinions held by the *Mughs* with regard to a future state of existence are by no means unfavourable to the cultivation of virtuous habits. It is their belief that there are many worlds, and that the earth has been subject to the several and repeated actions of fire and water. (A fact that will not perhaps be disputed by some of the most celebrated geologists of the present day.) The soul, they affirm, may pass through many stages of existence, either in this or another world; the nature of each change depending upon its moral condition. For instance, a person of virtuous habits may aspire to a state of being far more elevated than that before enjoyed: if on the contrary, he shall have been of a

vicious disposition, his future state will be that of an evil spirit, or some grovelling and pernicious animal, such as a hog, toad, serpent, &c. A gentleman residing at *Rambree* has made me acquainted with a singular instance of the firm belief entertained by the *Mughs* in the transmigration of souls. A young woman who lives at *Rambree*, in very good circumstances, declares that she is the mother of a man *much older than herself;* this she accounts for by saying, that he was *born to her during a former life.* She has a scar under the left ear produced, as she affirms, by a cut from her husband's *dhao.* She further states that she died of grief, in consequence of the partiality shewn by that cruel husband for his elder wife. This story is not only credited by the neighbours, but its truth is assented to by the individual whom she calls her son. The idea was probably produced, in the first instance, by the circumstance of her having been born with that curious mark under the ear, and afterwards confirmed by a dream or some other cause favouring the publicity of a tale that owes its popularity to a belief in the transmigration of souls.

January 16th.—As the morning was very cold, I did not leave *Singhunnethe* before the sun had well risen, and the fog that hovered round the mountains had been somewhat dispelled. The route at first lay over patches of rice-stubble, and then took a direction across several small ranges of hills, the most elevated of which was covered with a red iron clay similar to that on the "*red hill*" near the town of *Rambree.* From the summit of this hill, I enjoyed a fine prospect of the channel that divides the eastern side of the island from the district of Sandoway. The hills of *Lamoo* and *Kalynedong* rose on the opposite shore, and the distant mountains of *Yoomadong* were faintly visible amidst the clouds that surrounded them. Descending this range I approached the village of *Saain-kyong,* celebrated for its lime. The limestone is found at the foot of a high hill to the left of the road. This was the first limestone that I had seen on Rambree Island; and it is so concealed by the jungle, that had I not been previously made aware of its existence and inquired for its site, I should have proceeded on my journey unconscious that such a rock was in my neighbourhood. From its appearance and more particularly from the rocks with which it is associated, I am inclined to class it with the "*upper fresh-water limestone*" found in tertiary formations; it is of a greyish white-colour; of a fine compact texture, but very brittle. It occurs in several detached masses of a globular or columnar form, and although I made every possible search along the ravines in its neighbourhood, I could discover nothing that would indicate the slightest approach to a stratification; nor has this species of limestone been discovered in

any other part of the island. There were no appearance of the fossil remains sometimes found in this rock, such as fresh-water shells, &c. The limestone is split into several large fragments by means of fire; these are again broken into smaller pieces, and the whole conveyed in baskets to the lime-kilns constructed on the banks of the *Saayre-kyong* creek, which at full tide has sufficient depth of water to admit of the approach of large boats. The whole of the lime used in *Rambree* Island, either for architectural purposes, or for the preparation of the edible chunam, is obtained from this rock. I was told that the lime, if taken in large quantities, was sold on the spot for $3\frac{1}{2}$ maunds per rupee, and that there were generally from 100 to 200 maunds collected. Crossing the creek at low water, I observed a few boulders of lias clay and calc spar imbedded in its banks. Proceeding from thence by a neat *Kioum* and grove of mangoe trees, I arrived at *Seppo-towng*, a village situated at the foot of a high hill covered with forest trees, and diversified with a few spots of ground cleared for the cultivation of the plantain tree. The tall *Girjuns*, with their white trunks divested of branches, were eminently conspicuous amidst their more graceful but probably less serviceable neighbours. The *Girjun* yields the oil that bears its name, and is used for combustion as well as for admixture with paints, varnishes, &c. (See Jour. As. Soc. II. 93.)

These trees are very abundant upon the island, and are farmed by Government. The mode of extracting the oil would appear to be as follows: a deep notch is cut in the trunk of the tree by means of a *dhao* or other instrument, and to this fire is applied until the wood becomes heated, and oil is seen to exude upon the surface. In the course of three or four days perhaps as much as a seer or a seer and a half of oil is collected within the cavity, and the tree will continue to afford a certain quantity of oil for five months or more, the collections being generally made every fifth day. When the oil has ceased to flow the tree is again cut in the same place, so that the whole of the wood which had been consumed or scorched is removed; fire is once more applied, and the oil collected as before. The notch has after repeated cuttings become so deep as would render any further attack upon the trunk, in this particular spot, destructive to the tree; in which case the *dhao* is laid upon another part of the trunk, and the same process observed as before mentioned. The tree is said to yield oil at all seasons of the year, precautions being taken during the rains to exclude the water. A large *Girjun* tree has been known to produce oil for 12 successive years, and as others are constantly supplying the place of those destroyed, there is no falling off in the amount of the several years' collections. The oil is sold in *Rambree* at the

rate of two or three maunds per rupee, and the greater part of it bought for exportation.

Outside the village and facing the road was the large and comfortable dwelling of the *Soogree* of *Seppo-towng*.

He was an elder man, of respectable appearance, and bore a good character in his district; inviting me to pass the night under his roof, he set about making arrangements for my reception, and appeared desirous of contributing as much as possible to my comfort. I learned from his followers who were sitting around me in an attitude of careless and indolent attention, that the *Soogree* was a native of *Ava*, and had come to the province when very young. He had since that time enjoyed several situations of emolument, and was a man of much consequence under the Burmah Government. The change of rule had produced a change in his circumstances, and the net amount of percentage* he now realized during the year will not perhaps exceed 400 rupees, probably not one-tenth of what he was accustomed to receive during the period of Burmah sovereignty in Arracan. Every thing around me but too plainly betrayed the existence of this decline of fortune. The stockade that surrounded his compound was gradually giving way under the pressure of age; no new posts supplied the places of those that had fallen in, and his shrubbery and garden forcibly reminded me of that which is said to have once belonged to the "*Man of Ross.*" The *Soogree*, said one of his dependents, cannot now afford to maintain that character for hospitality which once belonged to him; he cannot even provide for his most faithful followers, much less give bread to the stranger; he still continues to do so, however, as far as his means will permit, and there are none who approach his door without receiving a welcome to his board. I respected the feeling that induced the expression of these sentiments, and thought more favourably of my host in consequence thereof.

At the time that *Rambree* Island was subject to the Burmah rule, the *Soogrees* were invariably natives of the province; appointed and removed at pleasure by the Burmah *Méyowoon* or other local authority. The *Rooagongs* in like manner owed their nomination or dismissal to the *Soogree*. There appears to have been no regular maintenance authorized for the support of these functionaries, and consequently no limit to their exactions and misappropriation of the public funds. The *Soogrees* were not only entrusted with the collection of the revenue, (derived from demands made at pleasure on those able to comply with them, and which might therefore be viewed in the light of a property

* A *Soogree* receives 15 per cent. on the collections, and a *Rooagong* four per cent.

tax,) but were in some instances permitted to pass decisions in civil suits and also in cases of petty theft and larceny: at a time when corruption was so openly allowed and practised, it may be easily supposed that much gain was derived from this permission, and that little reliance could be placed upon the justice of the decisions, or statements made by these *Soogrees* respecting the gross amount of revenue derived from their several districts. One-fifth of the supposed produce was generally retained for the services of those delegated by authority to convey the royal mandates to the *Méyowoon*, and the remainder was devoured by that officer, the *Mroosoogree*, and others of the local Government. The *Soogrees* and *Rooagcngs* of districts having precisely secured to themselves such a share of the spoil as they could safely maintain without incurring the displeasure of the *Meyowoon*; the proceeds of other sources of revenue, especially that derived from the customs, (and which during the Burmah rule was in some instances considerable,) were remitted to the capital as the provision for the Prince Royal, to whose safe and auspicious keeping the Island of *Rambree* had been consigned.

In the evening I took a walk towards the *Kioum*, and on my arrival there found the *Phoongrees* on the point of setting out to a small village in the neighbourhood, with the view of performing the rites of sepulture over a young woman and her child. The former had died pregnant, and as is invariably the custom in such cases, the child had been removed from the womb, that it might be buried separately from its mother. It is further* deemed necessary that a river or creek should intervene between the graves of the parent and child; a precaution that was observed in the present instance. Desirous of witnessing a ceremony that was new to me, I asked leave to accompany the *Phoongrees*: a permission that was readily granted. As we drew near to the house of the deceased, the corpse of the young woman, borne upon a litter adorned with gold and silver leaf, was brought upon the pathway, and preceded by the *Phoongrees*, was taken to the ground appointed for its home. Immediately behind the bier clothed in their white dresses and with shaven crowns, were a group of *Mey-thee-layéng*†; and next to

* It is ordered by *Gautama* that the womb of every woman dying pregnant shall be opened, the child removed and buried apart from its mother; (a river or creek intervening between the graves.) Otherwise the mother will be born again for *ten* successive times, and be subject to the same misfortune.

† The *Máy-thee-layéng* are an inferior order of nuns wearing white dresses and living in convents of their own. Their discipline is less severe than that imposed upont he *Bhikúnni*, and their knowledge of the doctrines of the Buddhist fáith less extensive.

these followed the relatives of the deceased. A poor woman whom I learned was mother to the deceased continued to utter the most bitter lamentations the whole of the way, and did not cease from so doing until the corpse had been borne to the spot prepared for its final reception. When the litter had been placed by the side of the grave, pieces of cloth, with rice and plantains, were laid out as an offering to the *Phraa*; a leathern carpet was spread upon the ground, and on this the senior *Phoongree* seated himself, assuming a look of deep meditation, and partially concealing his face from public view by means of the *yattowing** that he bore in his hand. This done the *Méy-thee-layéng* and relatives of the deceased kneeled upon the ground in two rows (the former kneeling outside), and all made obeisance to the *Phoongree*. Rice was put into their hands, and each individual pronounced the following words in an audible and suppliant tone, receiving from the *Phoongree* replies to the several prayers that were put up.

(Congregation kneeling.) *Ogádhzah*†! *Ogádhzah*! I once, twice, and three times entreat for thy name's sake, and for the sake of thy holy ministers, that thou wilt forgive me those sins that I have commited in this life; and I also pray that in the future migrations of my soul I may be the first of human beings who shall meet with *Eye-yee-mud-deah*‡ *(ariya Maitríya)*, and finally attain to *Nibbhan*§ with him.

* *Yattowing*, a kind of fan, borne only by the *Phoongrees*.

† *Okása*, Holy Being.

‡ It is the belief of these worshippers of *Gautama* that the age of man was far greater formerly than it is at present; it is now said to be 60 years or more, it will gradually become less, until 10 years will be the average term of existence. This will be followed by an *increase*, so that 1000 years shall be the period of existence allotted to man. When this has occurred, all the images of *Gautama*, and all his sacred writings will be miraculously collected and consumed at the *Bhôdeebéng* tree. (The branches of this tree are said to be of gold, and the leaves to resemble emeralds. It is celebrated as the place where *Gautama* first became a *Phraa*, or religious teacher. To ascertain the site of this tree, as well as the locality of kingdoms and cities known at present by other names, was not one of the least important objects of the Burmah mission sent into Hindustan some years ago under charge of the *méyowoon Thoowé-dông-sa-ga-soo*.)

The destruction of the images and writings of *Gautama* will be succeeded by the nativity of the *Phraa Eye-yee-mud-deah*; and all good men then residing upon earth will become his disciples. Occurrences similar to those above described as consequent to the *Nighban* of *Gautama* will mark the departure of *Eye-yee-mud-deah* from the world. *Rámah Phraa* will then appear, and he will declare his successor.

§ *Nibbhan*, *annihilation*, properly. If a man, or woman, is eminently virtuous in this life, he or she, may hope to attain to a *Nibbhan*, *i. e.* not to be born again, but to become as air, smoke, &c. without sense, substance, or shape.

(Phoongree.) You have once, twice and three times entreated of me in prayer, and you may hope that your sins will be forgiven to you; and that you will hereafter meet with *Eye-yee-mud-deah*, and attain to a *Nibbhan*.

C. *Ogadhzah! Ogadhzah!* once, twice, and three times I vow that I will not commit those five mortal sins which are spoken of in the holy writings, and which I am forbidden to commit.

P. You have declared that you will not this day commit those sins. Is that which you have said true?

C. I will do according to that which I have said.

P. Do you believe in the *Phraa Gautama?* do you believe in his holy writings, and do you acknowledge his ministers?

C. All these do I believe and acknowledge.

P. If you do believe in these*, take not the life of any living being this day; neither steal; neither commit adultery; neither bear false witness; and do not make use of intoxicating liquors.

C. All these sins will I carefully avoid.

Gshén Phraa† *!* Accept of these offerings, I pray thee, and pardon the sins that I have committed in this life; pardon also the sins of the deceased for whom these offerings are also presented; and grant that during this life, or in the future migrations of my soul I may not suffer harm from the five enemies‡ of mankind, If I shall be born again as *man*, let me, I pray thee, be placed in a condition far superior to that enjoyed by my fellow creatures; if as a *spirit*, let me be as *Suh-gyah (Sagyá* or *Indra)*, in the world of spirits.

Accept of these offerings, I pray thee; they are made not for my good alone, but for the future benefit of my parents and relatives, as well as for my spiritual teachers and the rulers of the land. They are made also for those who suffer torment in *Ngah-yeh*§; for the spirit in the world above and for all living beings. I call *Muth-soon-dyéh*‖ to witness that these offerings are made not for my individual good alone, but for the benefit of all that have the breath of life.

(Water is here poured upon the ground through one of the pieces of cloth that had been presented to the *Phraa*. The water percolates through the earth, and is supposed to reach the abode of *Muth-soon-*

* These are the five mortal sins.

† Lord! Master! &c.

‡ The five enemies of mankind are, 1, Fire; 2, Water; 3, The Rulers of the Land; 4, Robbers; 5, Wild Beasts.

§ Hell, (q. Purgatory?)

‖ *Muth-soon-dyéh* (*Vasundarè*) is the "Recording Angel" who resides in the earth; hears, and marks down every thing that is said.

ဂိဟိသုခဇိုတ်

ယြောကာသ ယြောကာသ ကာယကံ၊ ဝဒီကံ၊ မနောကံ၊ သတ္တဒေါသခသိ
ဓိသာအပြစ်တို့ကိုလွတ်ပါစေခြင်းငှာ၊ ပဌမ။ ဒုတိယ။ တတိယ။ စတုတ္ထ နှ
ဖြစ်ကြောင့်သုမင်္ကြောင့် မြောက်အောင်။ ဘုရား ရတနာတော်၊ တရားရတနာတော်။ သံဃာ၊ ရတ
နာတော်။ ရတနာသုံးပါးတို့ကို။ အာဒိလိုက်မိလတ်ခဲ့ချိန်တွင်။ ဂုဏ်ပုံတော်ပုံ၊ မြောက်ကာ
တော့ရသောအကြောင်း အားဖြင့်။ အပယ်လေးပါး။ ကပ်သုံးပါး။ ရပ်ပျက်ခြင်းမှစ၍ပါး၊ ဇာ
သူမြို့ငါးပါး။ တို့မှကင်းဝေးခြင်းသည်သာဖြစ်၍။ နောင်လာလတ္တံ့သောအရိယ
မဂ္ဂင်ယျာဘုရား။ သွင်ပွင့်တော်မူသောခါ။ ကိုးတိုင်ကိုးကြိမ်လက်ဦးစွာပင်
တွေ့ရ၍။ မက်တရာ၊ ဗိုလ်တရာ၊ နိဗ္ဗာန်တရား၊ တော်မြတ်ကို။ မလျှတ်မလွဲအမြဲ
ဇော်အမှတ်ပြုတွေ့ရသည်ကိုဖြစ်ရပါလိုကြ။ ။ ။ ဤသို့ဂုဏ်ခုံပုဇော်ပူဇော်ရသောအ
ကြောင်းအားဖြင့်အပ ယ်လေးဘေး၊ ကပ်သုံးပါး၊ ရပ်ပျက်ခြင်းစသော၊ ဇာသူမြို့ငါးပါး တို့မှ။ ကင်း
ဝေးခြင်းသည်သာဖြစ်၍။ နောင်လာလတ္တံ့သောအရိယမေတ္တေယျ၊ မြတ်ခြားဘုရား။
သွင်ပွင့်တော်မူသောအခါ။ ကိုးတိုင်ကိုးကြိမ်တိုင်လက်ဦးစွာ။ ပူဇော်တွေ့ရ၍။ မက်ဗိုလ်နိဗ္ဗာန်
တရား၊ တော်မြတ်ကို။ မလျှတ်မလွဲ။ အမြဲဇော်။ အမှတ်ရကြသည်ဖြစ်ကျေစေကုံ။ ။
ယြောကာသ ယြောကာသ အဟံဘန္တေ တိသရဏေန သဟပဉ္စသီလံ ဓမ္မံယာစာမိ
မိအနုဂ္ဂဟံကတွာသီလံဒေထမေဘန္တေ။ ။ ဒုတိယံပိအဟံဘန္တေ တိသရဏေန
သဟပဉ္စသီလံဓမ္မံယာစာမိအနုဂ္ဂဟံကတွာသီလံဒေထမေဘန္တေ။ ။ တ
တိယံပိအဟံဘန္တေ တိသရဏေန သဟပဉ္စသီလံဓမ္မံယာစာမိအနုဂ္ဂဟံကတွာ
သီလံဒေထမေဘန္တေ။ ။ နမောတဿဘဂဝတော အရဟတော သမ္မာသမ္ဗုဒ္ဓဿ။ ။
ဗုဒ္ဓံသရဏံဂစ္ဆာမိ။ ဓမ္မံသရဏံဂစ္ဆာမိ။ သံဃံသရဏံဂစ္ဆာမိ။ တိသရဏေန ဂမနံ
ပရိပုဏ္ဏံ။ ။ အာမေဍိတ။ ။ ပါဏာတိပါတာဝေရမဏီ။ အဒိန္နာဒါနာဝေရမဏီ။

ကာမဂေသုမိစ္ဆာစာရာဝေရမဏီ။ မုသာဝါဒါဝေရမဏီ။ သုရာမေရယမဇ္ဇပ
မာဒဋ္ဌာနာဝေရမဏီ။ ။ တိသရဏေနသဟပဉ္စသိက္ခာသမာဒါနံ။ ။ ဘန္တေ အဂ္ဂဝံသရာမယံ။ အ ကျွ
နှ်ုပ်တို့သည်။ သံသာရဝဋ္ဋဒုက္ခတော၊ သံသရာတည်ဟူသော။ ဝဋ်ဆင်းရဲအ
ပေါင်းတို့မှ။ မောစနဏ္ထာယ။ ထွက်မြောက်ပါရခြင်းအကြိုဟု။ တိသရဏုပဓာ
သုမ္မာသော။ သရဏာဂုဏ်နှင့်အကျိုး။ ဒဂ္ဂိဓနာဒဂ်။ အလျှုရွေ့ကိုကို။ ပါ
တေတွာသွမ်ဖျဖျ်။ ဒေမဂပါလှူပုဇ္ဇော်ပါကုံ၏။ ။ ဘန္တေ။ အဂ္ဂဝံသရာ။ မ
ယံအကျွန်နှုပ်တို့သည်။ ကာလံကတာဝဒ်။ အဝဆစိဘဝေဟောင်းသို့ပြောင်း
ဆွားလေသောသူကို။ ဥဒ်ဒိစ္စရေမတ်ပြုဖျ်။ ဇုမံဝတ္ထုံ။ ကျိုဖြင်ပုဆိုအစဖျ်သ
ညာတို့ကို။ ဒေမဂပါလှူပုဇ္ဇော်ပါကုံ၏။ ကျိသို့အကျွန်နှုပ်တို့သည်။ ကပါ
လှူပုဇ္ဇော်ပါကုံသောအကြိုအားဖြင့်။ အပယဝိလေးပါး ကပါသုမိပါး ရပျ
ဆ်ဖျစ်ပါး ရံသူမြိုးငါးပါးတို့မှ။ ကင်းလွတ်သည်သာဖြစ်ဖျ်။ သုခံလူချမ်သာ
နှတ်ချမ်သာနိဗ္ဗာန်ချမ်သမြတ်ကိုရလိုပါ၏။ ဘန္တေ အဂ္ဂဝံသရာ။ မယံအကျွ
နှ်ုပ်တို့သည်။ ပြုရသောကောင်းမှုကြောင့်။ မွေးသည်မိခင်မွေးသည်ဘခ
င်။ ဆွာသွား။ ဘိုကြီးတွာကြီးရေမြေသွင်မှစဖျ်။ အ မျှပေးဝေဖာကုံ၏။ အထ
က်ကိုဘဝက်အံကိုအဝိစီ။ အနုန္တစကြဝဠာ။ ဘီလာတုပါခြင်းအကြောင်း မ
ဖျ်။ သုမဓဆယ်တဘုန်။ ကျင်လည်ကုံသောဝေဿကမ္မာဒုက္ခိတာ။ သုခိတာ။ သတ္တ
ဝါအပေါင်းတို့ကိုအ မျှပေးဝေဖာကုံ၏။ ဝသုံဒ္ဒေဖျ်မြေနုတ်သား ကိုလည်
အမျှပေးဝေပါကုံ၏။ ဝသုံဒ္ဒေဖျ်မြေနုတ်သား သည်အကျွန်နှုပ်တို့သည်ကာ
လဖျ်ညဿာ ဧကျိဘင်မေညား သောလည်။ အကျွန်နှုပ်တို့သည်။ ပြုပါရသောကော
င်မှုကြောင့်နောင်သောကာလ။ သက်သေခံလျှာသည်ဖြစ်စေသော။ ။ ။ ။
အမျှရသည်ဖြစ်စေသော။ အမျှအမျှ။ သာဓုသာဓု။ ။ ပုဒိအာ။ ။ ဒုဋ္ဌိတံ။

dyĕh, who has been invoked to bear witness to the sincerity of the above declaration.)

This done, all arose from the ground; the corpse was taken out of the litter and deposited in the grave. I observed that pawn and spices had been placed in the mouth of the deceased, for the purpose as I was informed of rendering the odour of the body, consequent to decomposition, less offensive to the bystanders. At the sight of the corpse, the poor woman commenced her lamentations afresh, and as my curiosity was satisfied, I returned to the *Soogree's* habitation, leaving the *Phoongrees* to perform over the grave of the child (on the opposite bank), a service in every respect similar to that I have just described.

January 17th.—The *Mughs* can form no other idea of the distance intervening between one place and another beyond what is derived from the time taken in going over it. In a country like this, abounding with impediments of every description, any other species of measurement was out of the question, so substituting my elephant for a *Perambulator*, and making every allowance for the several obstructions met with, I conceive the distance between *Oogah* and *Singhunnethe* to be as much as 16 miles; from that to *Seppo-towng* 12 miles; and as many more from thence to *Rambree*.

Bidding adieu to the good old *Soogree*, I set out at day-break on my journey to the capital of the island. The *Saaynekyong* creek, after winding through the vale to the right, suddenly takes a turn into the interior, crossing the road within a very short distance of *Seppo-towng*. As the tide was at the flood the elephants were unloaded and swam across; a boat having been placed at the disposal of myself and followers. Proceeding onwards the route was but a repetition of what had been met with on the preceding day. Patches of paddy ground, succeeded by long mountainous ranges with the same abrupt ascent and inclination, were the never failing features of the country passed over between *Singhunnethe* and *Rambree*. The soil on the hills was generally a red clay, containing nodules of chert, and felspar combined with talc. Had I possessed even a common acquaintance with botany, I might have derived much pleasure in the examination of the various vegetable tribes that surrounded me. Unfortunately I was a stranger to the greater number, recognizing only those of most frequent occurrence, such as the *Girjun*, *Tilsah*, *Jharral*, wild *Peepul*, and a host of *Mimosas*. There were also some very pretty creepers, and a vine which corresponds in description with that given me of the black pepper-plant*. After the

* The black pepper-plant is found on the hills in the Sandoway district.

first two or three ranges had been overcome, we approached the village of *Leppang*, the site of an old stockade, and scene of an encounter between the Burmah chief *Némyo-sooyah**, and the Ramoo Rajah *Keembrang*, in which the latter was shamefully defeated. From thence it is but a short distance to *Tseembeeyah* and *Kéhsree*, the latter prettily situated on the plain, and surrounded with clumps of trees. Among the inhabitants of *Kéhsree* are a class of people engaged in the oil manufacture, and who shall receive further notice hereafter. The oil is prepared chiefly from the *Thél*, and the mills are in every respect similar to those used in Bengal. Beyond *Kéhsree* is *Koyandowng*† with the two guardian temples on its summit: and to the right of that, the "*Red Hill*‡" of *Rambree*, almost destitute of verdure, and answering in appearance to that predicated by its name. Tiger traps of a novel construction were very numerous in the ghats leading to the town. *Rambree* has on several occasions been much infested with tigers; they have been known to come into the town shortly after dark, and entering the houses, carry off the inhabitants. Cattle and poultry are even now continually taken away, and it is considered very dangerous to sleep outside upon the *michaun*. To facilitate the description of one of these traps, I have endeavoured to represent by a drawing the several parts of which it is constructed.

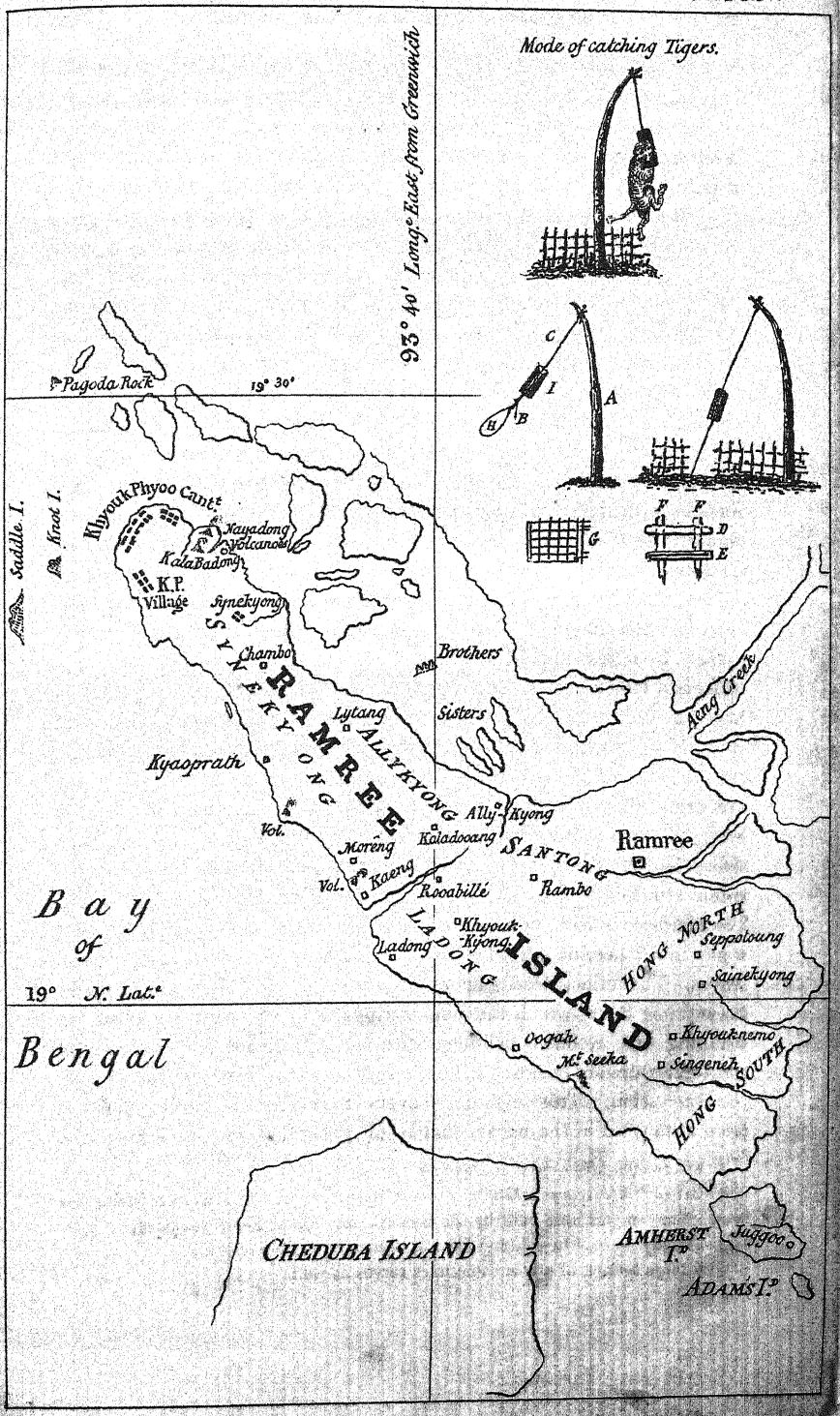
A, is a long§ pole possessing great strength and elasticity, which is bent and held down by B, a peg connected with C, a good thick cane rope. The peg B, is fixed with great care between the bars D, and E,; the bar D, having been previously fastened to the two posts F, F, which are driven into the ground. That part of the platform marked G, is brought into contact with the bar E, and the peg B. H, is a noose laid upon the platform, and I, a heavy wooden cylinder so nicely attached to the cane rope that the least jirk causes it to fall. The platform is laid upon the path frequented by the tiger, (generally a gap in a fence, or a ravine,) and carefully concealed with grass and leaves. The animal treads upon it and it gives way, disturbing the bar E, and peg B, on which the pole springs up to its natural position, bringing the wooden cylinder with such violence upon the arm of the tiger, (already caught in the noose,) that it is generally broken by the concussion. This cylinder covers that part of the leg that has been entangled in the noose, and is of great use in preventing the

* Afterwards *Meyo-woon* at *Rambree*.

† Called "*St. George's Hill*" by the troops quartered at *Rambree* during the war. The temples were built by the Burmah Meyowoon *Yeh-jutta-gong*.

‡ Already noticed in vol. 2nd (1833), Journal Asiatic Society.

§ A large branch of a tree sometimes serves as well.


Mode of catching Tigers.
93° 40' Long.e East from Greenwich
19° 30'
Pagoda Rock
Saddle I.
Knot I.
Khyouk Phyoo Cant.t
Nauadong Volcanos
Kala Badong
K.P. Village
Synekyong
SYNEKYONG
RAMREE
Chambo
Lytang
Ally Kyong
Brothers
Sisters
Aang Creek
Kyaoprath
Voi.
Moreng
Kaeng
Ally-Kyong
Kaladoaing
SANTONG
Ramree
Rambo
Rooabillé
Bay of Bengal
19° N. Lat.e
LADONG
Ladong
Khyouk-Kyong
ISLAND
HONG NORTH
Seppotoung
Sainekyong
Oogah
Mt. Seeka
Khyouknemo
Singeneh
SOUTH HONG
CHEDUBA ISLAND
AMHERST I.
Juggoo
ADAMS I.
A
B
C
D
E
F
G
H
I

animal from gnawing the rope. The beast hangs suspended in the air at the mercy of the villagers, who dispatch him by means of clubs or bamboos hardened in the fire, and pointed at the end so as to resemble pikes.

Arrived at the highest point of the ascent over *Koyandowng*, the large and pretty town of *Rambree*, surrounded with hills and divided by a creek that is seen in the distance meandering towards the sea, appears spread out to view in the vale below.

(To be continued.)

III.—*Memorandum of an Excursion to the Tea Hills which produce the description of Tea known in Commerce under the designation of Ankoy Tea.* *By* G. J. Gordon, *Esq.*

[Communicated by Dr. N. Wallich, Sec. Com. Tea Culture.]

Having been disappointed in my expectations of being enabled to visit the Bohea hills, I was particularly anxious to have an opportunity of personally inspecting the tea plantations in the black-tea district of the next greatest celebrity, in order to satisfy myself regarding several points relative to the cultivation on which the information afforded by different individuals was imperfect or discordant.

Mr. Gutzlaff accordingly took considerable pains to ascertain, for me, from the persons who visited the ship, the most eligible place for landing with the view of visiting the Ankoy hills; and Hwuy Taou bay was at length fixed upon as the most safe and convenient, both from its being out of the way of observation of any high Chinese functionaries who might be desirous of thwarting our project, and from its being equally near the tea-hills, as any other part of the coast, at which we could land. As laid down in the map of the Jesuits, there is a small river which falls into the head of this bay, by which we were told we should be able to proceed a good part of our way into the interior. We should of course have preferred proceeding by the Ankoy river, which is represented in the same map as having its source to the west of Ngau-ki-hyen and falling into the river which washes Sneu-chee-foia, were it not for the apprehension of being impeded or altogether intercepted by the public functionaries of that city. In order to make ourselves as independent as possible of assistance from the people, we resolved to dispense with every article of equipment which was not necessary for health and safety. The weather had for some days been comparatively cold, the thermometer falling to 55° at sunrise and not getting higher than 66° during the

day, so that warm clothing not only became agreeable, but could not be dispensed with during the nights; arms for our defence against violence from *any* quarter, formed likewise a part of our equipments, and, trusting to money, and Mr. GUTZLAFF's intimate knowledge of the language and of the people for the rest, we left the ship on the morning of Monday, 10th November, proceeding in the ship's long boat towards the head of the bay, where the town of Hwuy Taou is situated.

The party in the boat consisted of Mr. GUTZLAFF, Mr. RYDER, (second officer of the "Colonel Young,") Mr. NICHOLSON, late quartermaster of the "Water Witch," whom I had engaged for the projected Woo-re journey, and myself, one native servant and eight lascars. The wind being unfavourable, we made rather slow progress by rowing, but taking for our guidance the masts of some of the junks which we observed lying behind a point of land, we pulled to get under it, in order to avoid the strength of the ebb tide, which was now setting against us. In attempting to round the point, however, we grounded, and soon found that it was impossible to get into the river on that side, on account of sand-banks which were merely covered at high water, and that it was necessary to make a considerable circuit seaward to be able to enter. This we accomplished, but not till 1 A. M. At this time a light breeze fortunately springing up, we got on very well for some time, but were again obliged to anchor, at ¼ past 2, from want of water. As the tide rose we gradually advanced towards the town of Hwuy Taou, till we came to one of those bridges, of which there are several along the coast, that extend over wide sand-flats that are formed at the mouths of the rivers. These bridges are constructed of stone piers with slabs of stone laid from pier to pier, some extending over a space of 25 feet and upwards, and others being from 15 to 20 feet space. As the length of this bridge cannot be less than three quarters of a mile, the whole is very striking as a work of great labour, if not exhibiting either much skill or beauty. We were informed by some boat people that we should not find water to carry us beyond the bridge, but observing some tall masts on the other side, we resolved on making the experiment and pushing on as far as we could. It was almost dark when we passed under the bridge, and we had not proceeded far when we were again aground. This, however, we attributed to our unacquaintance with the channel, and as the tide floated us off, we continued advancing, notwithstanding the warning of a friendly voice from the bridge that entreated us to return to the town, promising us comfortable quarters, and a guide, &c. Being rather distrustful of the motives for this advice,

however, we proceeded for some time longer, but at length found it impossible to proceed farther, the ebb having at the same time commenced. We therefore spread an awning, and prepared to make ourselves as comfortable as possible for the night. The day had been the warmest we had experienced for a month past, but the night was very cold, and our boats, as may be imagined, far from commodious for so many people. At day-light we found that there was not six inches of water in any part of the channel, and from the boat we stepped at once upon dry sand. The survey from the bank showed us plainly that it would be impossible to proceed any farther by water. We accordingly prepared to march on foot, taking with us three lascars who might relieve each other in carrying our cloak-bag of blankets and great coats, as well as some cold meat. We ordered the people to prepare a meal as fast as possible, intending to make a long stretch at first starting, and Mr. NICHOLSON was directed to remain in charge of the boat with five lascars, to move her down under the bridge on the return of the flood, and there to wait our return for four or five days. Crowds of people now began to crowd round the boat, moved by mere curiosity. Mr. GUTZLAFF induced some of them to get ducks and fowls for the use of the boat's crew, and strange to say prevailed on one man to become our guide, and on two others to undertake to carry our baggage, as soon as we should be a little farther off from the town and out of the way of observation.

After a little, an old gentleman made his appearance on a chair who proved to be the head man of the town: he inquired whence we came and whither we were going, which we freely told him. With these answers he seemed perfectly satisfied, probably from finding them correspond with what he had been already told by some of the people with whom we had communicated on the subject in seeking information and assistance. He measured our boat with his arms, but offered us no obstruction nor even remonstrance. We observed him, however, after he had interrogated us, sending off two or three messengers in different directions, which made us the more anxious to be off. It was however past 9 o'clock before Mr. RYDER had completed his arrangements for the boat's crew, and the sun was already powerful. We were soon joined by our guide and the coolies, and our cavalcade winding along the foot paths, which are the only roads to be met with, made an imposing appearance. Mr. GUTZLAFF and the guide led the way, followed by a lascar with a boarding pike; next came the baggage, attended by a lascar similarly armed. I followed with pistols, and attended by a lascar armed with a cutlass, and Mr. RYDER carrying a fowling piece and pistols brought up the rear. Skirting the town of

Hwuy Taou, we proceeded in a N. N. E. direction at a moderate pace for an hour and a half, when we stopped at a temple, and refreshed ourselves with tea. Nothing could be more kind or more civil than the manners of the poeple towards us hitherto, and if we could have procured conveyance here so as to have escaped walking in the heat of the day loaded as we were with heavy woollen clothes, we should have had nothing farther to desire; as it was, my feet began already to feel uncomfortable from swelling, and after another hour's marching, I was obliged to propose a halt till the cool of the evening. Fortunately we found, however, that chairs were procurable at the place, and we accordingly engaged them at half dollar each. These were formed in the slightest manner, and carried on bambu poles, having a cross bar at the extremities, which rested on the back of the bearer's neck, apparently a most insecure as well as inconvenient position; but, as the poles were at the same time grasped by the hands, the danger of a false step was lessened. We had not advanced above a mile and a half before the bearers declared they must eat, and to enable them to do so, they must get more money. With this impudent demand we thought it best to comply, giving them an additional real each. After an hour's further progress we were set down at a town near the foot of the first pass which we had to cross. There the bearers clamourously insisted on an additional payment before they would carry us any further. This we resisted, and by Mr. GUTZLAFF's eloquence gained the whole of the villagers who crowded round us, to join in exclaiming against the attempted extortion. Seeing this the rogues submitted and again took us up. Mr. G. mentioned that while we were passing through another village, the people of which begged the bearers to set us down that they might have a look at us, they demanded 100 cash as the condition of compliance. The country through which we passed swarmed with inhabitants, and exhibited the highest degree of cultivation, though it was only in a few spots that we saw any soil which would be deemed in Bengal tolerably good; rice, the sweet potatoes, and sugar-cane were the principal articles of culture. We had now to ascend a barren and rugged mountain, which seemed destined by nature to set the hand of man at defiance; yet, even here there was not a spot where a vegetable would take root, that was not occupied by at least a dwarf pine, planted for the purpose of yielding fire-wood, and a kind of turpentine; and wherever a nook presented an opportunity of gaining a few square yards of level ground by terracing, no labour seems to have been spared to redeem such spots for the purpose of rice cultivation. In ascending the pass we soon came to places where it was difficult for our bearers to find a

footing, and where they had consequently to pick out their steps as they advanced. To assist themselves they gave the chair a swinging motion with which they kept time in raising their feet.

This was far from agreeable, and the first impression felt was that it was done merely to annoy, but we very soon saw that the object was different. The highest point of the pass I should conjecture to be about 1200 feet above the plain, and the descent on the north side to be nearly equal to the ascent from the south, say 1000 feet. At half-past four we arrived at a rather romantic valley, which was to be our halting place for the day. We proposed to the bearers to carry us on another stage next day, but for this they had the impudence to ask five dls. per chair. This of course we would not listen to for a moment, and were afterwards happy that we got rid of such rascals, as good bearers and on moderate terms were procurable at the place. The name of this village is Lung-tze-kio. It seems once to have been a place of greater importance than now, exhibiting marks of dilapidation and decay. Even the foot-path over the pass must have been at one time an object of attention, as we found in several places the remains of a sort of pavement, and of bridges which were now nearly destroyed. The inn at which we stopped afforded as few and mean accommodations as could well be imagined, but we were able to get some fowls deliciously grilled, on which, with the aid of sweet potatoes, and of the salt beef which we brought with us, we made a most hearty repast. Among the people who came to see us at the inn was a very respectable looking young man, a student, who won Mr. GUTZLAFF's heart by asking him for instruction in religion. Unfortunately the whole contents of a box of religious tracts, and other books had been distributed in the morning, and Mr. G. was unable to supply him with any. The request was no doubt prompted by the report of the people who had accompanied us, and who had themselves partaken of Mr. G.'s liberality before they volunteered. This young man strongly recommended to us to alter our course, magnifying the distance of Twa-Bo to which we were bound to 100 *li* or 30 miles, and telling us that at the distance of 40 *li* or 12 miles to the S. W. we should find tea plantations of a very superior description. The exaggeration of the distance led me to suspect the accuracy of the information in other respects, and I had heard enough of contradictory evidence already, not to be swayed by it in the present instance.

Nov. 12*th*.—Got into our chairs at a quarter past six A. M. and proceeded along a narrow rugged dell to a town called Koe-Bo. Several nice looking hamlets were seen on the way. The people were engaged

in reaping the rice, which seemed heavy and well filled in the ear. In several places I observed that they had taken the pains to tie clumps of rice stalk together for mutual support. Sugar-cane is bound in the same way, and for additional security the outside canes are mutually supported by diagonal leaves, which serve at the same time to form them into a kind of fence. The leaves are not tied up round the stalks as in Bengal; the cane is slender, white, hard, and by no means juicy or rich; yet, bating the black fungus powder, which is very prevalent, their surface is healthy, and close growing in a remarkable degree. We arrived at Koe-Bo at eight o'clock, and finding we could get water conveyance for part of the way on which we were proceeding, we engaged a boat for that purpose. After a hearty breakfast we embarked at 10 A. M. amidst crowds of people who covered the banks of the river at the ghát. On inquiry we found that the river on which we were proceeding in a W. N. W. course, was the same which we passed at Gan-Ke-Luyu, and flowed to Suen-chee-foo. The boat was large, but light, and being flat-bottomed drew very little water. The stream was so shallow that it was only by tracing the deepest part of the channel from side to side of its bed that we were able to advance at all. This was done by poling; in several places the stream was deepened by throwing up little banks of sand so as to confine its course within a channel merely wide enough for the boats to pass through. I estimate the width from bank to bank at 200 yards, and should judge from the height at which sugar is cultivated above the level of the present surface, that the greatest depth in the rainy season does not exceed 10 feet. Being entirely fed by mountain torrents its rise must be often very sudden, but I did not observe any traces of devastation in its course. Its name, Ghan-ke or "peaceful stream," is probably derived from this circumstance; the valley on each side seemed well cultivated, the banks being principally occupied by sugar-cane. At every village the people poured as usual to see us out, vying with each other in marks of civility and kindness. The day, however, becoming very hot, we took shelter from the sun under the roof of the boat, to the disappointment of many who waded through the water to gratify themselves with a sight of the strangers. Coming at last to a high bank close to a populous town, they actually offered the boatman 400 cash if he would bring us to; and on his refusal, the boys began pelting the boat with clods and stones. On this Mr. GUTZLAFF went on deck to remonstrate, and Mr. RYDER to intimidate with his gun. Betwixt both the effect was instantaneous, and the seniors of the crowd apologised for the rude manner in which the boys had attempted to enforce the gratification of their curiosity. We had been in vain all

yesterday and to-day looking out for a glimpse of tea plantations on some of the rugged and black looking hills close in view, though at almost every place where we halted we were assured that such were to be found hard by. At three P. M. we reached a town near the foot of the pass by which we were to reach Taou-ee, the place of our destination. There we proposed selling our gold, which for the sake of lightness I had brought with me in preference to silver, not doubting that I should find little difficulty in exchanging it at its proper relative value whenever required. In this, however, we had been disappointed at our last abode, and we were therefore much vexed at learning from our conductors that the inhabitants of Aou-ee were of such a character that the less we had to do with them and the shorter our stay amongst them the better. Some proof of this we had as we were stepping on shore, being for the first time rudely questioned as to our destination and object, and why we had come armed; our reply to the latter query being, that we had armed ourselves with the resolution of resisting violence should it be offered by robbers or others, we were allowed to pass quietly on. The hill we had now to ascend was more rugged, and in some places more abrupt, than that over which we were first carried; and though we had set out at three o'clock, the sun had set long before we came to the end of our journey. The moon was unfortunately obscured by clouds, so that nothing could be more unpleasant than the unfortunate *hits* our toes were constantly making against stones, and the equally unfortunate *misses* where an unexpected step downwards made us with a sudden jerk throw our weight on one leg. At length we reached a village at the further end of the pass, the inhabitants of which were so kind as to light us on the remainder of our way, by burning bundles of grass, to the eminent danger of setting fire to their rice fields now ripe for the sickle. Arrived as Taou-ee we were hospitably received by the family of our guide, and soon surrounded by wondering visitors.

Mr. GUTZLAFF speedily selected one or two of the most intelligent of them, and obtained from them ready answers to a variety of questions regarding the cultivation of the plant. They informed him that the seed now used for propagating the plant was all produced on the spot, though the original stock of this part of the country was brought from *Wae-eshan*, that it ripened in the 10th or 11th month, and was immediately put into the ground where it was intended to grow, several being put together into one hole, as the greater part was always abortive. That the sprouts appeared in the 3rd month after the seeds were put into the ground, that the hole into which the seeds were thrown are from three to four inches deep, and that as the plants grow the earth

is gathered up a little round their root; that leaves are taken from the plants when they are three years old, and that there are from most plants four pluckings in the year. No manure is used, nor is goodness of soil considered of consequence, neither are the plants *irrigated*. Each shrub may yield about a *Tael* of *dry* tea annually (about the 12th of a pound). A Mow of ground may contain three or four hundred plants. The land tax is 300 cash (720 dols.) per Mow. The cultivation and gathering of the leaves being performed by families without the assistance of hired labourers, no rate of wages can be specified; but as the curing of the leaf is an art that requires some skill, persons are employed for that particular purpose, who are paid at the rate of 1 dl. per pecul of fresh leaf, equal to five dollars per pecul of dry tea. The fire-place used is only temporary, and all the utensils as well as fuel are furnished by the owner of the tea. They stated that the leaves are heated and rolled seven or eight times. The green leaf yields one-fifth of its weight of dry tea. The best tea fetches on the spot 23 dls. per pecul, (133⅓ *lbs.*) and the principal part of the produce is consumed within the province, or exported in baskets to Formusa. That the prevailing winds are north-westerly. The easterly winds are the only winds injurious to the plants. Hoar frost is common during the winter months, and snow falls occasionally, but does not lie long nor to a greater depth than three or four inches. The plant is never injured by excessive cold, and thrives from 10 to 20 years. It is sometimes destroyed by a worm that eats up the pith and converts both stem and branches into tubes, and by a gray lichen which principally attacks very old plants. The period of growth is limited to six or seven years; when the plant has attained its greatest size. The spots where the tea is planted are scattered over great part of the country, but there are no hills appropriated entirely to its culture. No ground in fact is formed into a tea plantation that is fit for any other species of cultivation, except perhaps that of the dwarf pine already alluded to, or the Camellia Obeifora. Mr. Gutzlaff understood them to say that the plant blossoms twice a year, in the eighth moon or September, and again in winter, but that the latter flowering is abortive. In this I apprehend there was some misapprehension, as seed of full size, though not ripe, were proffered to me in considerable quantities early in September, and none were found on the plants which we saw. I suspect that the people meant to say that the seeds take eight months to ripen, which accords with other accounts. We wished much to have spent the following day (the 13th) in prosecuting our inquiries and observations at Tawand and its neighbourhood, but this was rendered impractible by the state of our finances. We had plenty of gold, but no one could be found who

would purchase it with silver at any price. We therefore resolved on making the most of our time by an early excursion in the morning previous to setting out on our return.

We accordingly got up at day-break, and proceeded to visit the spot were the plants were cultivated. We were much struck with the variety of the appearance of the plants; some of the shrubs scarcely rose to the height of a cubit above the ground, and those were so very bushy that a hand could not be thrust between the branches. They were also very thickly covered with leaves, but these were very small, scarcely above $\frac{3}{4}$ inch in length. In the same bed were other plants with stems four feet in height, far less branchy and with leaves $1\frac{1}{2}$ to 2 inches in length. The produce of great and small was said to be equal. The distance from centre to centre of the plants was about $4\frac{1}{2}$ feet, and the plants seemed to average about two feet in diameter. Though the ground was not terraced, it was formed into beds that were partly levelled. These were perfectly well dressed as in garden cultivation, and each little plantation was surrounded by a low stone fence, and a trench. There was no shade, but the places selected for the cultivation were generally in the bottoms of hills, where there was a good deal of shelter on two sides, and the slope comparatively easy. I should reckon the site of the highest plantations we visited to be about 700 feet above the plain, but those we saw at that height and even less appeared more thriving, probably from having somewhat better soil, though the best is little more than mere sand. I have taken specimens from three or four gardens. Contrary to what we had been told the preceding night, I found that each garden had its little nursery where the plants were growing to the height of four or five inches, as closely set as they could stand; from which I conceive that the tea plant requires absolutely a *free* soil, *not wet* and *not clayey*, but of a texture that will retain moisture; and the best site is one not so low as that at which water is apt to spring from the sides of a hill, nor so high as to be exposed to the violence of stormy weather. There is no use in attempting to cultivate the plant on an easterly exposure, though it is sufficiently hardy to bear almost any degree of dry cold.

By half-past 10 A. M. we set out on our return, in chairs which we were fortunate enough to procure at this village, and reached the banks of the river at Aou-ee a little before one o'clock. In the first part of our way we passed by some more tea plantations on very sterile ground. One in a very bleak situation, with nothing but coarse red sand by way of soil, seemed to be abandoned. Our reception at Aou-ee was much more civil than it had been the preceding

day; the people suggested that we should remain there till a boat could be procured. The day, however, being tolerably cool, we crossed the river, and proceeded on foot along its banks to Kre-bo, where we arrived about four P. M. On the road a man who had seen us endeavouring to sell our gold the day before, told us he believed he could find us a purchaser. Mr. GUTZLAFF accordingly accompanied him to the house of a farmer, who after having agreed to give 18 dollars for 30 dollar's worth of gold, suddenly changed his mind, and said he would only give weight for weight. At Koe-Bo, however, we were more successful, procuring 18 dollars for the same 30 dollar's worth of gold. On the road the villages poured forth their population as we moved along. At one place they were actually overheard by Mr. GUTZLAFF thanking our guides for having conducted us by that road, and proposing to raise a subscription to reward them. At Kre-bo we learned that some petty officers had been inquiring after us, which frightened our guides, and made us desirous to hasten our return. Having procured chairs we pushed on accordingly to Koe-ee, our first resting place, where we arrived about seven P. M., and halted for the night. Next morning, the 14th, we mounted our chairs before day-break, but after going a little way the bearers let us down to wait for day-light, and we took the opportunity of going to look at a Chinese play which was in the course of performance hard by. There were only two actors but several singers, whose music to our barbarian ears was far from enchanting. Crossing the pass we met great numbers of people carrying salt in baskets hung in bangies, as in Bengal, a few with baskets full of the small muscle reared on the mud flats near the place of our landing. After getting into the plain we took a more direct road for Taou than that by which we had left it. The people forsook their work on the fields, and emptied their numerous villages to gaze at us. As the morning was cold I wore a pair of dark worsted gloves, which I found excited a good deal of speculation. The general opinion was, that I was a hairy animal, and that under my clothes my skin was covered with the same sort of fur as my hands. In China gloves are never worn. At length one more sceptical than the rest resolved to examine the *paw*, and his doubt being thus further strengthened, he requested me to turn up the sleeve of my coat. I did so, at the same time pulling off a glove to the admiration of the multitude, who immediately set up a shout of laughter at those who had pronounced the strangers of a race half man and half baboons. We met some officers in chairs attended by soldiers, but they offered us no interruption, not even communicating with us. Our bearers, however, easily prevailed on theirs to exchange burthens, each party being thus enabled to direct

their course to their respective homes. We arrived at Hwuy Taou before noon, and immediately embarked for the ships, which we reached at three P. M. We learned from Mr. NICHOLSON that after our departure, and while the boat was still aground, a number of Mandarins came down, and carried off almost every thing that was on board, but the whole was returned after the boat was floated down below the bridge. As we had no explanation of the matter, we concluded that this proceeding might have been intended for the protection of the property from plunder by the people of the town. We found that one of the seed contractors had despatched a quantity of Bohea seeds, arrived during our absence, with a letter stating expectation of being able to send a further supply and to procure cultivators, who would join the ship in the 11th or 12th month. On the same evening I embarked on the Fairy, and reached Lintin on Monday the 17th November, with my tea seeds, just one week after our landing at Hwuy Taou to explore the Hwuy tea hills. I have been more minute in my details of this little expedition, than may at first sight appear needful, with the view of showing the precise degree and kind of danger and difficulty attending such attempts. Our expectation was, at leaving the ship, that we should reach the head of the bay by nine or 10 o'clock A. M. and attain a considerable distance from Hwuy Taou the same day, and thus have a chance of passing without attracting the notice of any of the Wanfoo or Government officers. Had we waited to ask their permission it would of course have been refused, and we should have been directed in the most authoritative manner to return to the ship. We were not a little alarmed when aground in the morning, lest the old gentleman who measured our boat should have deemed it his duty to intercept our progress; but we took care to go on with preparations for our march, as if nothing of the kind was apprehended. It is this sort of conduct alone that will succeed in China. Any sign of hesitation is fatal. Had we shown any marks of alarm, every one would have kept aloof for fear of being implicated in the danger which we seemed to dread; on the other hand, a confident bearing, and the testimony borne by the manner in which we were armed, that we would not passively allow ourselves to be plundered by authority, inspired the like confidence in all those with whom we had to do; for the rest of the narrative shows that from the people left to themselves we experienced nothing but marks of the utmost kindness and good nature, except indeed, where money was to be got:—there the Chinese, like the people of other countries, were ready enough to take advantage of the ignorance of strangers, though with such a fluent command of the language as Mr. GUTZLAFF possessed he was able to

save us from much fleecing in that way. I need scarcely add, that no good can result from an attempt to penetrate into the interior of China by a party of foreigners, unless some one of them has at least a moderate facility in expressing himself in conversation with the people.

IV.—*Observations on an Article in Loudon's Magazine of Natural History, on the subject of the Albatross. By Lieut.* Thomas Hutton, *37th Regt. N. I.*

At page 147 of the 32nd Number of Loudon's Magazine of Natural History, a contributor observes:

"Coleridge somewhere in his wild and magical 'Rime of the Antient Mariner,' says of the Albatross, whom he introduces as a bird of Omen."

"At length did cross an Albatross,
Thorough the fog it came;
As if it had been a Christian soul,
We hail'd it in God's name.
"It ate the food it ne'er had eat,
And round and round it flew;
The ice did split with a thunder-fit,
The helmsman steer'd us through.
"And a good south-wind sprung up behind,
The Albatross did follow,
And every day for food or play,
Came to the mariners' hollo."

"Had this Albatross been a sea-gull, the above might have been fact, as well as fancy."

To which another writer adds, at page 372 of the 34th Number.

"And not less so, it may be remarked, if it be presumed, that Coleride actually speaks of the Albatross itself. This bird is one of the Laridæ, or gull tribe; and as our correspondent Mr. Main has in person remarked to us, 'every voyager round the Cape of Good Hope may have observed it to follow and fly round the passing vessel from day to day.' He added, 'this large bird seems to subsist on any animal matter which floats on the water. In their following of ships they are easily caught by a strong hook baited with a bit of pork or beef.—Their body appears emaciated, being small in proportion to the size of their plumage; as the wings, when extended, measure 9 or 10 feet from tip to tip. They appear to be very stupid birds, perhaps from being broken-hearted, from the paucity of food they meet with 800 miles from the nearest land.'

"Dr. Arnott, as quoted by Mr. Rennie, remarks, 'How powerful must be the wing muscles of birds which sustain themselves in the sky for many hours! The great Albatross, with wings extended 14 feet or more, is seen in the stormy solitudes of the southern ocean, accompanying ships for whole days, without ever resting on the waves.'"

"Mr. Main, whom apprehension of exceeding the truth always leads to speak within bounds, gives above the spread of the wings at 9 or 10 feet; Dr. Arnott,

as appears by Mr. RENNIE's quotation, at '14 feet or more;' while the specimen in the Zoological Society's Museum in Bruton Street, and we have seen this specimen, is set down in the Society's catalogue, where a picture of it is given at the following dimensions:—'Length from tip of bill to extremity of tail 3 feet 4 inches, expansion of wings, 9 feet.' The mean of these three statements of the spread of the wings of the Albatross is 10 feet 10 inches*: and although true, without doubt, is the proverb 'medio tutissimus ibis,' we care less about the precise dimensions, than to show that the expansion is on all hands admitted to be great. This great expansion of wings, and that wonderful provision in the physiology of birds, by which they are enabled to charge and fill every bone in their body with rarified air, to promote and secure as by a series of balloons their buoyancy; and together with the comparative smallness, and therefore lightness of the body, of the Albatross, in part prepare us to give credence to a supposition entertained by some, that this bird sleeps while on the wing, and the great distance from any land at which it is frequently seen towards the close of day farther favours the supposition.

"This power of sleeping in the air has been alluded to by THOMAS MOORE in his beautiful Eastern poem of Lalla Rookh, when describing a rocky mountain beetling awfully o'er the sea of Oman, he says:

'While on its peak, that braved the sky,
A ruin'd temple tower'd so high,
That oft the sleeping Albatross,
Struck the wild ruins with her wing,
And from her cloud-rocked slumbering
Started, to find man's dwelling there,
In her own silent fields of air."

"The Albatross is doubtless spoken of in the following facts, told us by a sailor friend, now dead and gone: 'A very large bird, sometimes alights on the yards of vessels passing the coast of the Cape of Good Hope, and no sooner is it upon the yards, than it is asleep, and while sleeping, is very easily captured. When upon the deck, it cannot soar into the air, on account of the length of its wings. It makes a loud and disagreeable noise when molested. It is called 'the Booby' by the crew.

"The term Booby is, we have since been told, commonly applied by sailors to any long-winged bird, of a whitish colour; although in the above case of the Albatross, the term would seem to express its incautious or booby-like habit of going to sleep within reach of molestation; a habit which those who scout the idea of the bird's sleeping in the air will impute to the desperateness of its necessity."

* I am informed by a gentleman at this station, who came out on the "William Fairlie," that an Albatross was shot on the 23rd March, in lat. 26° 57′ south, long. 29° 9′ west, which was wholly white, with the exception of a few feathers clouded with pale-brown on the wings. It measured 12 feet from tip to tip of the wings. On the 8th April, five more were shot in lat. 37° 18′ south, long. 14° 26′ east. The flesh was good, and not at all fishy to the taste. It was dry and insipid.

As there are several points in this paper on which the writer seems to be misinformed, and which are rather far-fetched, I have ventured to draw a few strictures on it, and to add an extract from a Journal which I kept during a voyage from England to Calcutta.

First then, speaking of Albatrosses, the writer says, "*They appear to be stupid birds, perhaps from being broken-hearted from the paucity of food, &c. &c.*"

The body of the Albatross, when cleared from the plumage, is certainly very small, and appears out of proportion to the great size of the bird in length and breadth; but, at the same time, though small in size, the two birds which I dissected were extremely plump and fleshy, bearing no signs of a paucity of food, of which there is an abundance, for who that has rounded the Cape has not seen the shoals of flying fish which ever and anon rise from the water as the ship disturbs them in her course. Fish, Mollusca, and Medusæ form the food of the Albatross.

Why then should he break his heart at the thoughts of starvation!!

Again, "*The great Albatross, with wings extended &c. is said to accompany ships for whole days without ever resting on the waves.*"

Here I would remark, that his not *having been seen* to settle, is no proof that he *did not* do so, during these whole days, to say nothing of the intervening nights—inasmuch as, it is very unlikely that he was watched for whole days incessantly by any person, and those who have been to sea, and have paid attention to these birds, must acknowledge that they do not merely "fly round the ship," but extend their flight far away over the boundless deep, and are lost to sight, ever and anon returning to the ship in their restless search for food.

Besides, the Albatross does not feed on the wing, but as far as my experience carries me, invariably settles on the water before taking his prey;—therefore it follows that for "*whole days*" he does not feed. No wonder his heart is broken, and his body emaciated. But surely the writer could never suppose that the almighty and merciful Creator, who has so fully provided for the wants of all his creatures, would neglect to supply the wandering Albatross, and doom it to pine away in misery and a state of half-starvation!

Next comes a supposition, that the bird sleeps on the wing, and that the great distance from land at which it is seen at close of day is thought to favour the supposition; in support of which, a pretty quotation from Moore is brought in, to prove, that "castles built in air," are as likely to break the rest of the wandering Albatross, as of man, his lord and master!

Now the Albatross being a sea-bird, and furnished with webbed feet—what hinders it from sleeping on the waves like other water-fowls?

Is not motion the effect of will? And does not sleep seal up our eyes in forgetfulness? How then can the Albatross continue its flight, when the will to move its pinions, and direct its course, is lost in sleep? The quotation proves the absurdity of the supposition by showing that the bird is "running his head against a wall!" What the wandering Albatross may do near land I cannot say, but at sea I never saw one rise so high even as the yards of the ship, although the Sooty Albatross *(Diomedea fuliginosa)* very frequently did.

With regard to the bird or birds which sailors call a "Booby*," I can say little, as I never had the good fortune to see one captured; but certainly from its flight and appearance at a distance, I should pronounce it to be a gull or petrel, but decidedly not an Albatross; here, however, I speak at random, and shall be happy to receive correction if necessary. Be it what it may, I cannot understand what "*desperate necessity*" there is for the bird's sleeping on board of ship, when it has a fine smooth sea to rest on, and a pair of good broad webbed feet, and a thick impenetrable plumage, made for the very purpose of enabling it to rest on the waters; we know that all water-fowl resort to the land occasionally, and the Booby, being some hundreds of miles at sea, may choose to rest on the only solid footing it can find, in order to break the dull monotony of a daily seat on salt-water!

But joking apart, may I not ask, on what did the Booby rest, before ships had made the passage round the Cape? unless they could sleep on the water, their necessities must have been much more disperate than in the present day!

To the trivial names applied by sailors and casual observers, to these birds, I attach no value whatever, as I have seen the folly of trusting to such names; for instance, one of the Albatrosses which I caught on my last voyage to India, was termed by the officers of the ship, "*a Mollymawk,*" and they laughed at the idea of its being an Albatross, merely because in size and plumage it did not agree with the bird which they were accustomed to term an Albatross. Nevertheless, *it is* a true Albatross! Another bird, the Sooty Albatross, was named "*a Peeroo!*"

* On 2nd May, "a Booby" was caught asleep on the rigging of the "*William Fairlie.*" It had the plumage wholly *brown*, and not white, as stated in Loudon. On being seized, it disgorged "five flying fish," all of good size. Does not this prove that there is no *scarcity of food?*

Sailors, like landsmen, who form opinions of the operations of nature, from mere casual and superficial observation, without condescending to look into causes and effects, must of course very often come to erroneous and ridiculous conclusions. Witness the following anecdote which occurred to me:

The boatswain told one of the passengers that the stormy petrels, or Mother Cary's Chickens, make no nest, but lay two white eggs on the water, and then take them under their wings to hatch them; during this time the male bird supplies the female with food!

This fable is, I believe, current among the lower class of seamen.

On telling this story, however, the *chief officer* laughed very heartily, and cautioned me not to receive as gospel every "yarn the boatswain chose to spin;" but lo! in a very few minutes, *he* told me *as truth*, a story which appeared to me fully as marvellous as the other: He said, that in some of the islands to the southward, and about Cape Horn, there is a bird called the "King Penguin," which had a *pouch between its legs*, into which it puts its egg, (for the Penguin only lays one,) as soon as laid; in this pouch the egg is kept for 24 hours, during which time the female remains on shore, but at the expiration of that time, the male bird, who is also furnished with a similar pouch, returns from his fishing excursions, and relieves the female by receiving the egg into his custody for the next 24 hours. They take a very long time to shift this egg from one pouch to the other, and although there are several species of Penguin on those islands none of them are furnished with a "*patent egg-boiler*," save his majesty the King Penguin of the Southern Isles!!

He added, that the bird may be induced to drop the egg, although reluctantly, by running a stick between its legs!!

Having offered these remarks, I shall proceed in my next, to give you an extract from my Journal, kept on the voyage, in which I noted down every circumstance connected with Natural History, and which being written not from memory, but from facts at the moment occurring, may perhaps be considered worthy of perusal.

Since writing the above, I have had an opportunity of perusing GEIFFITH's Translation of CUVIER, and find, that the Booby is stated to be the "Pelecanus Sula;" the plumage is thus described: "Belly and vent, all white, when young, all brown!" this is rather a meagre description, but nevertheless proves, that the Booby is not an Albatross, as supposed by the writer in Loudon's Nat. Hist.

V.—*Roof of the New Iron Foundery at Kásipur near Calcutta.*

We have requested Major HUTCHINSON of the Engineers, the architect of this elegant structure, to favour us with drawings of its various details, that we may make known, as far as the circulation of our journal permits, his very successful combination of the cast-iron truss with a wrought-iron tie to roofs of large span in this country. We are so little accustomed to see any thing else in India but the heavy flat roof with its massy timbers groaning under an inordinate load of terrace-work heaped up most disadvantageously in the centre to allow a slope for the water to run off, while the invisible white ant is scooping out the solidity of the timber, and the dry rot is corroding the ends that support the whole on the wall,—that the eye rests with quite a pleasurable sensation on the view of a light, airy frame-work like that before us, composed of materials indestructible, wherein the strains and pressures are counterpoised, the load lightened, the liability to crack and leak lessened, and the repair of every part rendered easy and entirely independent of the rest.

The progress of improvement is notoriously slower in Government operations than in private works. When cast-iron beams were first brought to India on private speculation, and were offered to Government by a mercantile house in this town, they were rejected. The roof of a large private godown was soon after constructed with them, and their efficacy thus proved; then immediately a re-action took place, and a large quantity was indented for by Government. The Hon'ble Court sent them out, and they have remained until now totally unemployed, although numerous public buildings have been erected since they arrived.

It was, we know, a subject of lengthened debate what sort of roof should be given to the foundery. A timber trussed roof had been sanctioned at 15,000 rupees, and we may, perhaps, rather attribute the substitution of the present one to the numerical reduction of the pecuniary estimate, than to any actual conviction of its superiority in other respects, for the beams being already provided, the whole cost of the present roof, exclusive of them, has been only rupees 11,000.

The New Foundery, or rather the room in which the cannon are turned and bored, is a spacious hall, of 169¼ feet long by 50 feet clear span in breadth, and 40 feet in height from the floor to the vertex of the roof; entirely open from end to end, lighted by a range of upper windows, and surrounded by a suite of apartments of half elevation. The steam machinery of the several borers and lathes, is arranged along one side of this room, in a compact and exceedingly neat manner. It is impossible

to attempt its description; those who are fond of mechanical inventions, will be amply gratified by an inspection of the whole, especially by the ingenious contrivance for adjusting the angle of the slide rests and cutters, for the exterior bevil of the gun:—the circular revolving tools for turning the trunnions:—the crane carriage for the guns, &c.

The self-acting principle by which the exterior of the gun is turned, while the interior is bored, so as to save one half of the time, while it ensures perfect concentricity of the outer and inner circles, is, we believe, an invention of Major Hutchinson's, who took the opportunity when on furlough, of visiting some of the principal founderies in Europe, and studied to adopt every improvement suggested by their inspection.

The whole apparatus is driven by a small engine of 10 horse power, which also works a circular, and a reciprocating, saw, and a loam-mill for the casting moulds of the foundery.

The superficial area of the hall is 8462 square feet; to form an idea of this magnitude, it may be mentioned that the noble edifice of the new Town Hall in Birmingham, is said to contain a larger space than any room in Europe, and will accommodate between three and four thousand persons sitting, or ten thousand standing; that room is 140 feet long, by 65 feet broad, making a superficial area of 9100 feet, which is only 638 feet more than the Kásipur apartment.

The roof consists of 10 trusses, Plate VI. Fig. 1, each composed of a pair of cast-iron beams pitched at an elevation of $12\frac{1}{2}$ feet in the vertex, and tied together at foot by a horizontal chain supported in the centre by a vertical rod suspended from the angle. The truss-frames are 15 feet 4.6 inches apart: they support light cross-beams and rafters of wood, upon which the planking of the roof is nailed. The weight of one truss with its entire load and chain, is equal to about five and half tons, diffused over the two iron beams.

The chain is three inches deep by one inch thick, = 3 inches in section, consequently the applicable force of tension of the chain is $3 \times 9 = 27$ tons, and the ultimate strength of it $3 \times 27 = 81$ tons. The above weight of five and half tons diffused over the two beams, $= 2\frac{3}{4}$ tons on each beam, gives according to the sine of the angle of elevation, a tension on the chains of about five and half tons, or only one-fifth the stretching weight, or one-fifteenth of the ultimate strength of the chains.

The iron beams and chains were all proved before they were put up, by suspending for several days without effecting the slightest apparent alteration, a weight of six tons from the vertex, producing a trial tension of about 12 tons, which is more than twice the actual tension.

Plan Section &c. of the Large Iron Trussed Roof Constructed over the Boring Room of the New Gun Foundry at Cossipore. by

Majr. G. Hutchinson. Engrs. F.R.S.
Supt. & Director of the Foundry.

1834

Length. 169½ ft.
Span. 50 ft.
Heigth of Vertex. } 40 ft.

Length of Beam 26 ft 10 In 3/10 Weight 25 Cwt

Vertex Rod. 6 feet to Centre of Link

Section Fig. 1.

Total Length of Link 24 ft 11 In. 9/10

Span 50 feet

Transverse Section thro the Vertex. B. C.

Fig. 2. Copper

Fig. 9

Fig. 10.

Section & Plans of the Iron Shoe

Fig. 4.

Fig. 5.

Vertex of Beams.

Fig. 8.

Fig. 7.

Fig. 11

Scale of Fig.s 4. 5. 8. 7. 8.

Fig. 3.

Longitudinal Section through the Vertex. A. B.

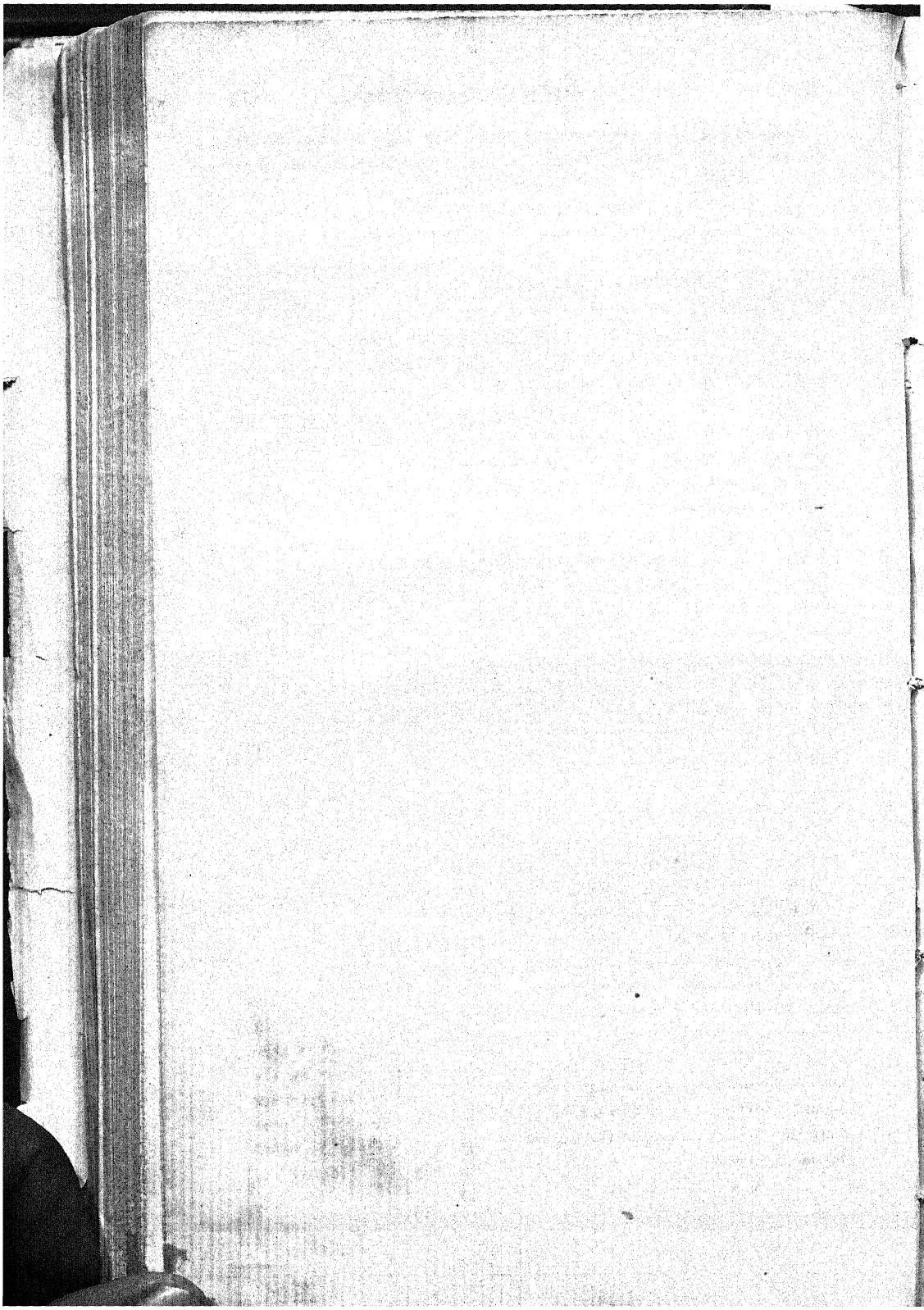
Vertex Rod

Plan. Fig. 2

Copper

Boarding

Scale of feet for figs. 1. 2. 3. 11.



Each extremity of the tie-rods is bolted to a kind of shoe, (represented in figs. 5 and 6,) resting upon a stone slab on the wall, into which the lower end on the iron beam abuts, (Fig. 1.)

Fig. 2, is a plan of the roof, shewing the disposition of the frame, planking and copper sheathing. In the section, Fig. 3, the longitudinal rod is seen which steadies all the ties from lateral shake.

Fig. 7, (*a*) shews on a larger scale the mode in which the longitudinal tie-rods (*á*) are united by a bolt, (Fig. 8,) having two right-hand screws, passing through the central coupling plates of the chains, and the eye of the suspension vertex rod. This rod being firmly attached by two bolts (*b*) through the beams at the vertex, any derangement whatever of the roof, either vertically or horizontally, is effectually prevented. At each end of the roof the longitudinal rods pass through the walls, to which they are firmly fixed.

Fig. 9, shews the horizontal overlaps of the copper sheathing, which are cemented with white lead, and Fig. 10, the mode in which the copper passes over the wooden battens fixed on the planks, to which only the copper is fastened by copper rivets; a copper cap or ridge-tile lies over the whole length, to prevent the insinuation of water at the fold: it answers this purpose so effectually, that the roof was everywhere found perfectly water-tight, during the late heavy season of rain, the first it had experienced.

The Kásípur roof was set up without the assistance of any scaffolding from below. An experimental truss of timber supported on chains, having been previously made to shew the advantageous application of iron chains instead of tie-beams of timber to roofs of so large a span, it was converted into a platform, moveable upon wheels along the top of the walls, upon which by means of a crane fixed at one end of the frame, the iron beams and every thing else was easily and expeditiously raised and fixed; the beams, &c. for the opposite side of the roof being passed upon wheels across the platform. The whole frame-work was put up in 20 days.

Before closing our short account of the Kásípur roof, we must notice a curious optical deception, for which we are somewhat at a loss for a correct explanation. On entering the room and looking up at the roof, it strikes every beholder that the roof has somewhat sunk, and the horizontal tie-rod is about five or six inches lower in the centre than near the walls. So firmly impressed were we of this being the case, that standing at one end of the room, and holding two flat brass rulers, overlapping one another before the eye, we could readily measure the apparent angle of the tie-rod by raising the ends of the rulers so as to coincide with the two halves of tie-rods. On mounting the

roof and looking in at the upper window of either end, the same effect was still visible, though in a diminished degree, and we were not convinced that it was a deception, until Major HUTCHINSON at our request caused an actual measurement to be made by a perpendicular wooden batten from an accurately adjusted level on the stone floor. It was then proved that there did not exist a difference of level even to the amount of a tenth of an inch. Whence arises the illusion? Is it that the eye, judging of directions by comparison with other objects, and having the numerous lines of the pent roof inclined in opposite directions to each half of the horizontal rods, is thus perplexed in its estimate? the ruler experiment is opposed to such an explanation. It may, perhaps, be owing to the effect of light from the upper windows, which frequently gives a curved appearance to wooden beams from the decrease of illumination from side to centre. If the phenomenon resemble the effect of the eyes in a portrait always looking the same whencesoever viewed, or the curves formed by spokes of a wheel passing a railing, as has been suggested, the effect should admit of a rigid explanation, and we may hope to obtain it from some one of our readers who may have time to investigate this singular deception.

NOTE.—The mode of calculating the strain upon the iron rods in the above account is familiar to engineers, but it may be acceptable to others (for in India every man is his own architect), to be furnished with a correct table of the strength of timbers and iron: the following extract therefore from Mr. BARLOW'S report on the subject to the British Association in 1833, may be acceptable. He prefaces it by a precis of the various opinions and theories hitherto formed to explain the strain and process of fracture, and strongly recommends TREDGOLD'S Treatises on Iron and on Carpentry. There is now no longer any disagreement on the leading principles connected with the strength of materials, excepting such as arise from the imperfect nature of the materials themselves, which furnish different results even in the hand of the same experimenter.

Formulæ relating to the ultimate Strength of Materials in cases of Transverse Strain.

Let l, b, d, denote the length, breadth and depth in inches in any beam, w the experimental breaking weight in pounds, then will $\frac{l\,w}{b\,d} = S$ be a constant quantity for the same material, and for the same manner of applying the straining force; but this constant is different in different modes of application. Or, making S constant in all cases for the same material, the above expression must be prefixed by a co-efficient, according to the mode of fixing and straining.

1. When the beam is fixed at one end, and loaded at the other,

$$\frac{l\,w}{b\,d^2} = S.$$

2. When fixed the same, but uniformly loaded,

$$\frac{1}{2}\quad\frac{l\,w}{b\,d^2} = S.$$

3. When supported at both ends, and loaded in the middle,

$$\frac{1}{4} \times \frac{l\,w}{b\,d^2} = \text{S}.$$

4. Supported the same, and uniformly loaded,

$$\frac{1}{8} \times \frac{l\,w}{b\,d^2} = \text{S}.$$

5. Fixed at both ends, and loaded in the middle,

$$\frac{1}{6} \times \frac{l\,w}{b\,d^2} = \text{S}.$$

6. Fixed the same, but uniformly loaded,

$$\frac{1}{12} \times \frac{l\,w}{b\,d^2} = \text{S}.$$

7. Supported at the ends, and loaded at a point not in the middle, n m being the division of the beam at the point of application,

$$\frac{n\,m}{l^2} \times \frac{l\,w}{b\,d^2} = \text{S}.$$

Some authors state the co-efficients for cases 5 and 6 as $\frac{1}{9}$ and $\frac{1}{11}$ but both theory and practice have shown these numbers to be erroneous.

By means of these formulæ, and the value of S, given in the following table, the strength of any given beam, or the beam requisite to bear a given load, may be computed. This column, however, it must be remembered, gives the ultimate strength, and not more than one-third of this ought to be depended upon for any permanent construction.

Formulæ relating to the deflection of beams in cases of Transverse Strains.

Retaining the same notation, but representing the constant by E, and the deflection in inches by δ, we shall have,

Case 1. $\frac{32}{1} \times \frac{l^3 w}{b\,d^3\delta} = \text{E}.$

2. $\frac{12}{1} \times \frac{l^3 w}{b\,d^3\delta} = \text{E}.$

3. $\frac{1}{1} \times \frac{l^3 w}{b\,d^3\delta} = \text{E}.$

Case 4. $\frac{5}{8} \times \frac{l^3 w}{b\,d^3\delta} = \text{E}.$

5. $\frac{2}{3} \times \frac{l^3 w}{b\,d^3\delta} = \text{E}.$

6. $\frac{5}{12} \times \frac{l^3 w}{b\,d^3\delta} \times \text{E}.$

Hence again, from the column marked E in the following table, the deflection a given load will produce in any case may be computed; or, the deflection being fixed, the dimensions of the beam may be found. Some authors, instead of this measure of elasticity, deduce it immediately from the formula $\frac{l^3 w}{3b\,d^2\delta} = \text{E}$, substituting for w the height in inches of a column of the material, having the section of the beam for its base, which is equal to the weight w, and this is then denominated the modulus of elasticity. It is useful in showing the relation between the weight and elasticity of different materials, and is accordingly introduced into most of the printed tables.

The above formulæ embrace all those cases most commonly employed in practice. There are, of course, other strains connected with this inquiry, as in the case of torsion in the axles and shafts of wheels, mills, &c. the tension of bars

in suspension bridges, and those arising from internal pressure in cylinders, as in guns, water-pipes, hydraulic presses, &c. but these fall rather under the head of the resolution of forces than that of direct strength. It may just be observed, that the equation due to the latter strain is

$$t\,(c-n) = n\,R.$$

where t is the thickness of metal in inches, c the cohesive power in pounds of a square inch rod of the given materials, n the pressure on a square inch of the fluid in pounds, and R the interior radius of the cylinder in inches. Our column marked C will apply to this case, but here again not more than one-third the tabular value can be depended upon in practice.

Table of the Mean Strength and Elasticity of various Materials, from the most accurate experiments.

Names of Materials.	Specific gravity.	C Mean strength of cohesion on an inch section, lbs.	S. $= \frac{l\,w}{4\,b\,d}$ Constants for transverse strain.	E. $= \frac{p^3 w}{b\,d}$ Constants for deflection.
WOODS.				
Ash, English,	760	17000	2026	6580000
Beech, ditto,	700	11500	1560	5417000
Birch, ditto,	700	....	1900	6570000
Deal, Christina,	680	11000	1550	6350000
Elm, English,	540	5780	1030	2803000
Fir, Riga,	750	12600	1130	5314000
Larch, Scotch,	540	7000	1120	4200000
Oak, variable, from	700	9000	1200	3490000
Oak, variable, to	900	15000	2260	7000000
Poon, E. Indian,	600	14000	2200	6760000
Pine, pitch,	660	10500	1630	5000000
Satin wood, B.	1020	10866	2403	6929108
Saul, E. Indies, B.	894	16351	2290	8748000
Sisoo, ditto, B.	1032	18500	2548	7922716
Teak, ditto,	750	15000	2460	9660000
Ditto, ditto, B.	729	21957	1447	6665142
IRON.				
Cast iron, from	7200	16300	8100	69120000
Cast iron, to	....	36000		
Malleable iron,	7760	60000	9000	91440000
Iron wire,	....	80000	....	.....

[Those marked B are extracted from Captain BAKER's list in the 8th volume of the Asiatic Researches, which contains a very full and valuable list of the strength of Indian woods.—ED.]

VI.—*Miscellaneous.*

1.—*Desiderata and Recommendations of the British Association for the Promotion of Science.*

In addition to the list of desiderata promulgated by the Association, on its first meeting, which we re-published in the first volume of this Journal, page 308, the "Third Report," for 1833, contains several new suggestions and inquiries, whence we hasten to extract such items as it may come within the power of Indian scientific men to elucidate.

In matters of scientific announcement, we are glad to perceive, that the English Government has undertaken the expense of reducing the observations of BRADLEY, MASKELINE, and POND, on the sun, moon, and planets, at the suggestion

of the Association. Also, that Colonel SYKES has been requested to prepare for publication his valuable statistical returns relative to the four collectorates of the Deccan, subject to the Bombay Government; while Professor JONES is to "*endeavour to obtain permission* to examine the statistical records understood to exist in great number in the archives of the India House, and to prepare an account of the nature and extent of them." Thus there may be some chance of the Reports of Dr. BUCHANAN seeing the light through this unexpected channel, although the Government of India has itself declined permitting the continuance of their publication on the nearly gratuitous terms proposed and acted on by Captain HERBERT for the Dinajpúr volume*!

DESIDERATA CAPABLE OF ILLUSTRATION IN INDIA.

Meteorology.

1. Experimental data for the theory of refraction.

What is the law of the decrease of temperature, or of density, in ascending? How does this vary at different times?

Can any means be contrived for indicating practically at different times the modulus of variation?

Does the refractive power of air depend simply on its density, without regard to its temperature?

Is it well established that the effects of moisture are almost insensible?

Can any rule be given for estimating the effect of the difference of refraction in different azimuths, according to the form of the ground?

When the atmospheric dispersion is considerable, what part of the spectrum is it best that astronomers should agree to observe?

2. That the Committee in India be requested to institute such observations as may throw light on the horary oscillations of the barometer near the equator.

3. That the Committee in India be requested to institute a series of observations of the thermometer during every hour of the day and night.

4. That the decrease of temperature at increasing heights in the atmosphere should be investigated by continued observations at stated hours and known heights. The hours of $9\frac{1}{4}$ A. M. and $8\frac{3}{4}$ P. M., as giving nearly the mean temperature of the year, are suggested for the purpose.

5. That persons travelling on mountains, or ascending in balloons, should observe the state of the thermometer, and of the dew-point hygrometer, below, in, and above the clouds, and determine how the different kinds of clouds differ in these respects.

6. That the temperature of springs should be observed at different heights above the mean level of the sea, and at different depths below the surface of the earth, and compared with the mean temperature of the air and the ground. Detached observations on this subject will be useful, but a continued and regular series of results for each locality will be more valuable.

7. That series of comparative experiments should be made on the temperature of the dew point, and the indications of the wet-bulb hygrometer, and that the theory of this instrument should be further investigated.

8. Observations on the horary oscillations of the barometer, at considerable heights above the sea. This more particularly applies to places near the equator.

9. Observations on the phenomena of wind at two stations, at considerably different elevations. The direction of the wind should be noted in *degrees*, beginning from the south, and proceeding by the west.

Magnetism.

10. That observations should be made in various places with the dipping-needle, in order to reduce the horizontal to the true magnetic intensity.

11. A regular series of observations conducted in this country on the diurnal variation of the needle.

Geology.

12. That measurements should be made, and the necessary data procured, to determine the question of the permanence or change of the relative level of sea and land on the coasts of Great Britain and Ireland, (or other parts of the world.) The measurements to be so executed as to furnish the means of reference in future times, not only as to the relative levels of the land and sea, but also as to waste or extension of the land.

* See Preface to the second volume of the Journal Asiatic Society.

13. That the history of ancient vegetation should be further examined, by prosecuting the researches into the anatomy of fossil wood, which have been exemplified in Mr. WITHAM'S recent volume.

14. That the quantity of mud and silt contained in the water of the principal rivers should be ascertained, distinguishing as far as may be possible, the comparative quantity of sediment from the water at different depths, in different parts of the current, and at different distances from the mouth of the river; distinguishing also any differences in the quality of the sediment, and estimating it at different periods of the year; with a view of explaining the hollowing of valleys, and the formation of strata at the mouths of rivers.

15. That the experiments of the late Mr. GREGORY WATT, on the fusion and slow cooling of large masses of stony substances, should be repeated and extended by those who, from proximity to large furnaces, have an opportunity of trying such experiments on a large scale; and that trial should be made of the effect of long-continued high temperature on rocks containing petrifactions, in defacing or modifying the traces of organic structure, and of the effect of the continued action of steam or of water at a high temperature, in dissolving or altering minerals of difficult solution.

16. That the dimensions of the bones of extinct animals should be expressed numerically in tables, so as to show the exact relations of their dimensions to those of animals now living; and also to show what combinations of dimensions in the same animal no longer exist.

17. That the following geological queries be proposed:

1. Are any instances of contorted rocks interposed between strata not contorted?

2. Is there any instance of secondary rocks being altered in texture or quality by contact with gneiss or primary slates?

3. Is the occurrence of cannel coal generally connected with faults or dislocations of the strata?

4. What is the nature of the pebbles in the new red sandstone conglomerate in different districts: do they ever consist of granite gneiss, micaslate, chert, millstone, grit, or any other sandstone which can be traced to the coal series?

18. The attention of residents in our remote foreign dependencies is invited to the two great questions of comparative geology and palæontology. 1. Is there or is there not such a general uniformity of type in the series of rock-formations in distant countries, that we must conceive them to have resulted from general causes of almost universal prevalence at the same geological æra? 2. Are the organic remains of the same geological period specifically similar in very remote districts, and especially under climates actually different; or are they grouped together within narrower boundaries, and under restrictions as to geographical habitats analogous to those which prevail in the actual system of things?

19. An examination of the geological structure of the countries constituting the great basin of the Indus, where, if in any part of India, it is supposed a complete series of secondary strata may be expected.

Zoology.

The Committee recommended to the consideration of Zoologists the following subjects of inquiry:

20. The use of horns in the class mammalia; the reason of their presence in the females of some, and their absence in those of other species; the connexion between their development and sexual periods; the reason of their being deciduous in some tribes, and persistent in others.

21. The use of the lachrymal sinus in certain families of the ruminantia.

22. The conditions which regulate the geographical distribution of mammalia.

23. The changes of colour of hair, feathers, and other external parts of animals; how these changes are effected in parts usually considered by anatomists as extra-vascular.

24. The nature and use of the secretions of certain glands immediately under the skin, above the eyes, and over the nostrils, in certain species of the grallatores and natatores; the nature and use of the secretion of the uropygial gland.

25. How long and in what manner can the impregnated ova of fishes be preserved, for transportation, without preventing vivification when the spawn is returned to water.

26. Further observations on the proposed metamorphosis of decapod crustacea, with reference to the views of THOMPSON and RATHKE.

27. Further observations on the situation of the sexual organs in male spiders, and on their supposed connexion with the palpi.

28. The use of the antennæ in insects. Are they organs of hearing, of smell, or of a peculiar sensation ?

29. The function of the femoral pores in lizards, and the degree of importance due to them, as offering characters for classification.

Botany.

30. An accurate account of the manner in which the woody fibre of plants is formed.

31. An investigation of the comparative anatomy of flowerless plants, with a view to discover in them the analogy and origin of their organic structure.

32. The cause of the various colours of plants.

33. The nature of the fæcal excretions of cultivated plants, and of common weeds; the degree in which those excretions are poisonous to the plants that yield them or to others; the most ready means of decomposing such excretions by manures or other means.

Tides. (See Journal Asiatic Society, vol. II. page 151.)

Falling stars. M. QUETELET'S mode of observing and recording the characteristic circumstances of these meteors is recommended to notice. "I take my station out of doors, in a situation which commands a good view of the sky, with a map of the heavens spread out before me. When a falling star appears, I mark on the map the point of its commencement, the line of its course among the nearest stars, and the point where it vanished. This is done by an *arrow-line*. A number of reference is added, which connects it with a book-register of the exact time, magnitude, duration, and other circumstances. Contemporaneous observations at distant stations are much desired.

2.—*Manilla Indigo, (so called.)*

There has lately appeared in the Calcutta market an article purporting to be Indigo from Manilla. The packages containing it are to all appearance Chinese, being covered with mats and tied round with split ratans like tea-boxes. A sample of this having been sent me in August last, for comparison of quality with other Indigo, I caused a portion to be incinerated, and found the ash highly ferruginous, and weighing 52 per cent. of the whole,—18 being the greatest percentage I had ever found, and that only in refuse Indigo. The specific gravity was 1·80. Some of the ash dissolved in muriatic acid afforded a copious precipitate to Mur. Barytes, and to Prussiate of Potash. I therefore imagined that the Indigo had been precipitated from the vat with a ferruginous alum, and proceeded no further with its examination.

Having been however recently favoured with another sample from Mr. C. K. ROBISON, under a suspicion that the substance was not Indigo but *Prussian Blue*, I submitted a portion to tests which at once proved the truth of this supposition. By digestion in caustic alkali, hydrocyanic acid may be taken up while the oxyde of iron remains behind; on acidifying the solution and adding to it a drop or two of sulphate of iron, the Prussian Blue is again formed. The readiest test, however, is to place a small portion of the suspected matter on a hot coal or iron. If it be indigo, a fine purple smoke instantly rises, and it takes fire. The Prussiate gives off water, and at last burns feebly. It is also much heavier than indigo, but its colour, in the cake, is a fine clear blue, rather of a coppery streak.

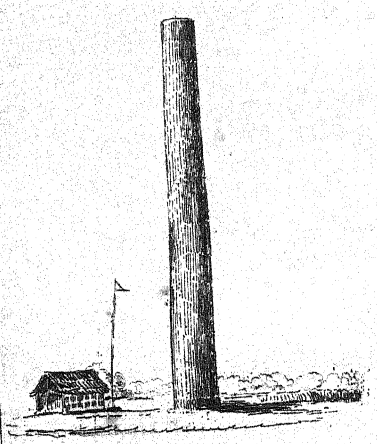
It is reported that the article in question was manufactured in America, and shipped to France, where Indigo was selling at 14 francs. Being unsaleable, it was re-shipped to America, whence it found its way to Canton, where it underwent some change, and was brought to Calcutta, and remains to spread alarm among our manufacturers of Indigo, at the prospect of a fair competition in the blue market they have so long monopolized.—ED.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of February, 1835.

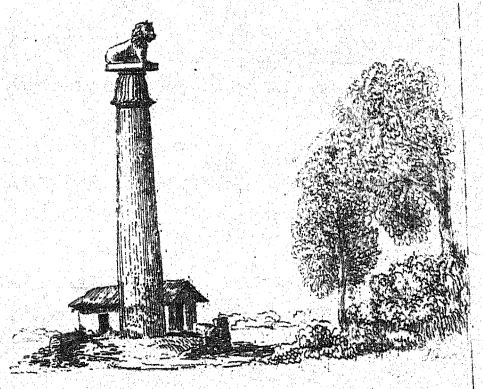
Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain, inches.	Wind.			Weather.		
	Standard Barometer at 32°.	Wet Barometer, do.	Aq. Ten. deduced.	Ther. in air.	Deff. or M. T. Depress.	Lessee's dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Aqs. Ten. deduced.	Thermometer in air.	Different.	Leslie's dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	Evening.
1	30,026	,344	,682	69,1	12,1	11,7	71	,973	,200	,773	71,5	14,3	14,3	68	48,2	106,2		nw.	nw.	sw.	clear.	clear.	clear.
2	,035	,360	,675	69,0	10,5	10,0	76	,954	,151	,803	72,1	13,3	13,1	75	55,0	100,4		nw.	nw.	w.	do	do	do
3	,043	,382	,661	68,3	7,7	7,5	89	,934	,184	,750	71,2	9,8	9,7	81	51,2	102,5		W.	nw.	nw.	do	do	do
4	,042	,322	,720	69,7	8,3	7,7	86	,936	,120	,816	73,3	11,4	11,1	78	57,0	105,2		ne.	nw.	nw.	do	do	do
5	,082	,334	,748	70,9	5,9	5,7	94	,960	,136	,924	73,9	8,1	7,9	87	54,2	106,1		ne.	w.	W.	do	do	do
6	,056	,280	,776	71,4	4,5	4,8	96	,960	,108	,952	74,3	7,7	8,4	85	54,4	106,0		E.	nw.	S.W.	fog.	do	do
7	,090	,316	,774	71,9	4,3	4,3	97	,964	,126	,938	74,1	7,8	7,0	91	58,7	....		NW.	n.	n.	cloudy.	hazy.	cumuli.
8	,102	,407	,695	69,2	6,0	5,8	92	,978	,209	,969	70,9	8,1	7,8	85	52,8	....		NW.	n.	n.	cumuli.	clear.	clear.
9	,054	,350	,704	69,9	6,2	5,7	91	,936	,186	,750	72,4	9,8	9,6	82	51,4	....		o.	nw.	nw.	do	do	do
10	,048	,349	,699	70,3	7,1	6,8	89	,923	,108	,815	73,3	10,5	10,6	78	54,2	107,2		n.	N.	nw.	clear.	do	do
11	,092	,298	,724	71,0	5,5	5,6	93	,894	,049	,845	74,9	9,6	10,2	80	54,2	127,0		w.	SW.	S.	fog heavy.	do	do
12	,025	,280	,745	71,4	8,7	8,4	85	,899	,080	,819	75,1	11,7	12,4	75	56,1	129,6		n-	nw.	sw.	do light.	do	do
13	,016	,224	,792	72,7	7,4	7,6	87	,830	,049	,781	76,0	9,2	10,6	80	54,2	126,1		o.	sw.	sw.	do heavy.	do	do
14	29,999	,198	,801	73,5	4,2	5,0	96	,898	,040	,858	76,9	9,2	10,7	81	55,2	119,3		o.	sw.	W.	do light.	do	do
15	,970	,170	,800	73,7	3,6	4,0	96	,819	,970	,879	77,0	8,1	10,0	83	58,7	122,9		os.	sw.	W.	thick fog.	do	do
16	,950	,140	,810	73,9	2,7	3,3	97	,819	,900	,930	77,3	7,2	9,3	84	60,1	112,1		os.	sw.	W.	do	do	cumuli.
17	,978	,990	,988	75,5	4,5	5,7	92	,864	,950	,914	77,3	9,3	9,8	81	63,2	115,8		ne.	nw.	nw.	haze.	do	misty.
18	30,060	,157	,903	75,0	6,1	6,5	90	,872	,980	,892	77,7	7,8	7,7	88	61,2	117,8		o.	n.	sw.	clear.	do	cir. cum.
19	,023	,150	,873	75,9	5,7	5,5	93	,918	,914	,004	79,9	11,0	11,4	81	64,2	122,6		nw.	SW.	sw.	do	do	cumuli.
20	,018	,128	,890	76,5	6,8	6,4	91	,909	,994	,915	80,3	10,7	10,9	82	60,8	117,6		o.	W.	sw.	haze.	do	clear.
21	29,989	,083	,906	77,0	4,5	4,5	97	,844	,784	,060	81,4	10,8	11,1	81	62,8	116,5		o.	SW.	W.	dense fog.	do	do
22	,921	,003	,918	77,7	3,8	3,7	98	,808	,785	,023	80,4	9,9	10,5	82	67,1	112,2		os.	S.	sw.	do	hazy.	do
23	,923	,989	,934	78,3	4,0	3,3	98	,777	,790	,987	81,1	7,8	7,2	90	69,0	115,0		se.	W.	sw.	clear.	do	misty.
24	,829	,888	,941	78,0	4,0	4,3	98	,608	,585	,023	82,9	9,4	9,7	85	65,5	120,0		nw.	S.	S.	haze.	cumuli.	cumuli.
25	,790	,840	,950	98,5	4,6	5,0	95	,640	,580	,060	81,2	9,8	10,4	87	67,2	122,1		S.	S.	S.	clear.	do	do
26	,764	,792	,972	79,2	5,3	5,4	93	,700	,700	,000	80,0	11,4	14,0	79	65,0	188,0		S.	S.	sw.	scud.	cir. cum.	clear.
27	,899	,980	,919	75,5	12,1	12,4	70	,820	,826	,994	79,5	16,4	16,3	60	61,7	....		W.	nw.	nw.	clear.	fine.	do
28	,923	,062	,861	75,9	6,9	7,3	89	,786	,797	,989	80,2	16,1	16,6	64	56,0	....		sw.	sw.	nw.	haze.	clear.	hazy.
Mean,	29,988	,172	,816	74,3	6,0	6,2	91	,876	,975	,902	76,6	10,2	10 ,7	70,5	58,5	115,1		change of monsoon.			fine weather.		

The instruments the same and situated as usual.

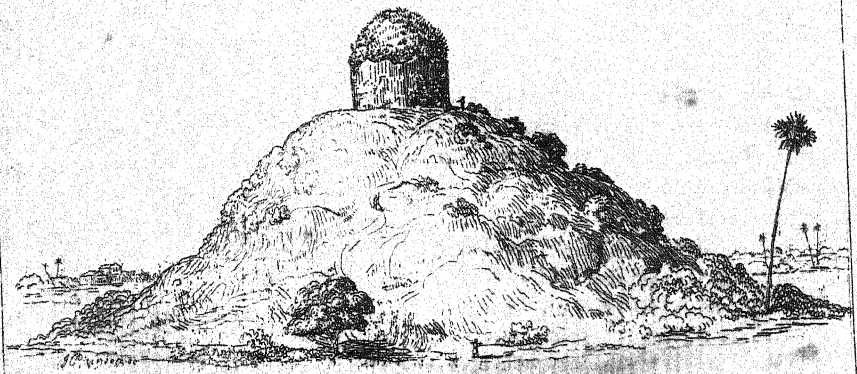
The Radhia Pillar.
in Zilla Sarun.



The Bakhra Pillar.
in Tirhut.



The Mound and Dehgope at Kesariah. in Tirhut.



Ancient Funeral Vases from the neighbourhood of Hyderabad.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 39.—*March,* 1835.

I.—*Account of a Visit to the Ruins of Simroun, once the capital of the Mithila province. By* B. H. Hodgson, *Esq. Resident in Nipal.*

[In a letter to the Editor.]

I trust that the drawings and inscriptions lately sent you from Bakra, Mathiah, Rádhiah, and Késariah, will serve to draw attention towards the remains of Hindu science and power still extant in this direction—the Mithila, or Maithila Dèsa of the Sástras, and North Bihár of the Moghuls. But it is not merely on the British side of the boundary that these astonishing traces of ancient civilization exist; for, in the Nipalese Taraï, also within a few miles of the hills, where now (or recently) the tiger, wild boar, and wild buffalo usurp the soil, and a deadly malaria infects the atmosphere for three-fourths of the year, similar vestiges are to be found. The Nipalese Taraï is synominous amongst Europeans with pestilential jungle. It was in the halls of Janakpur, however, that the youthful Ráma sought a bride: it was from the battlements of Simroun that the last of the Déva dynasty defied so long the imperial arms of Toglak Sháh!

But the ruins of Janakpur and of Simroun *still exist* in the Nipalese low-lands: and he who would form a just idea of what the Hindus of Mithila achieved prior to the advent of the Moslems must bend his pilgrim steps from the columns of Rádhiah and of Mathiah, in the British territories, to the last but still astonishing vestiges of the cities of Kings Janaka and Nányupa, in those of Nipal.

Of the Nipalese Taraï it might justly be said, until very lately,

'A goodly place it was in days of yore,
But something ails it now: the place is cursed.'

Five centuries of incessant struggle between Moslem bigotry and Hindu retaliation had indeed stricken this border land with the

double curse of waste and pestilence. Nature, as it were, in very scorn of the vile passions of man, having turned the matchless luxuriance of the soil and climate into the means of debarring his future access! Such *was* the Nipalese Taraï until 1816. But since that period the peace and alliance existing between the two efficient Governments of the hills and the plains have given security to the borderers, and man is now fast resuming his ancient tenure of this fertile region. Still, however, there is little temptation or opportunity for Europeans to enter it; and as chance recently conducted me past the ruins of Simroun, I purpose to give you a hasty sketch of what I saw and heard; because these ruins are evidently disjecta membra of the same magnificent body to which the mausoleum of Késriah, and the solitary columns of Mathiah, of Rádhiah, and of Bakhra belong. About 15 miles from the base of the hills, and at a nearly equal distance from the Bágmatty, south of the former, and west of the latter, stand the remains of Simroun, in the Nipalese district of Rotahat, and opposite to the Champárun division of the British zillah of Sárun.

The boundary of Nèpal and of our territories confines the ruins to the south, and the Jamuni Nadí to the west. On the *immediate* east lies the village of Kachorwa, and on the north, that of Bhagwánpur, both belonging to Nèpal. Here, in the midst of a dense jungle, 12 miles probably in circuit, rife with malaria, and abounding in tigers, wild boar, and spotted axis, are secluded these wonderful traces of the olden time. The country around is well cultivated *now*, both on our and the Nipalese side, but no one presumes to disturb the slumber of the genius of Simroun; superstition broods over the tainted atmosphere; and the vengeance of Káli is announced to the rash peasant who would dare to ply an axe, or urge a plough, within her appropriately desolate domain. It was only with difficulty that my elephants could make their way through the jungle; and when I had reached a central position, and ascended an elevation of some 25 feet, composed of the debris of the palace, nothing but a wilderness met my eye. Yet it is barely 500 years since Simroun was a pakka, fortified city, the pride and the defence of Mithila! After the war with Nipal, Lieutenant BOILEAU, I think, surveyed these ruins, and drew up a plan of them. What is become of it, I know not; and regret that my own opportunity of research was limited to one hasty visit. In this, however, I traced the northern wall, in all its extent: measured the dimensions of the great Pókrá or reservoir called Isrá; and clambered to the top of what were once the citadel and the Ráni-bás or Mahal Saraï. On my return I had much conversation with an intelligent Bráhman of Bhagwánpur, who told me that in April and May,

when the jungle is at its barest state, the form and extent of the city may be distinctly traced. From his communications, and from my own observations, I gather that the form of the city is a parallelogram, surrounded by an outer and an inner wall, the former of unburnt, the latter of burnt, brick—the one having a compass of seven cos, and the other, of about five cos.

On the eastern side, six or seven wet ditches may still be traced, outside the pakka wall, and three or four on the western side. The Isrá reservoir or tank is still perfect. It is 333 paces along each greater, and 210 along each shorter, face; and its containing walls or sides consist of the finest burnt bricks, each of which is a cubit square, and nearly a maund in weight. 50 to 60 yards of causeway, constructed of similar bricks or tiles, are yet entire in the neighbourhood of the palace; and vestiges of the same causeway, traceable at other points, indicate that all the streets of the city were of this careful and expensive structure. The remains of the palace, of the citadel, and of the temple of the tutelary goddess, exhibit finely carved stone basements, with superstructures of the same beautifully moulded and polished bricks for which the temples and palaces of the valley of Nèpal are so justly celebrated. I measured some of the basement stones, and found them each 5 feet long by $1\frac{1}{2}$ broad and deep: and yet these blocks must have been brought from a distance of 25 miles at least, and *over* the lesser range of hills; for, till you come to the second or mountainous and rocky range, no such material is to be had.

Some twenty idols, extricated fron the ruins by the pious labour of a Gosain, are made of stone, and are superior in sculpture to modern specimens of the art. Many of them are much mutilated; and of those which are perfect, I had only time to observe that they bore the ordinary attributes of Puránic Brahmanism. Not a single inscription has yet been discovered: but wherefore speak of discovery where there has been no search? I noticed four or five pakka wells round, and each having a breast-work about three feet above the ground, similar precisely to the wells of this valley.

What I have called the citadel is styled on the spot the *Kotwáli Choutara*, and my palace is the *Ráni-bás*. The latter has a very central position. The Kotwáli Choutara is in the northern quarter; and the great tank, called Isrá Pokrá, is about $\frac{3}{4}$ of a mile from the north-east corner of the city wall. As already mentioned, the last is still complete: the two former exist only as tumuli, some 20 to 25 feet high; and more or less coated with earth and trees.

Hindu tradition, eked out by a couple of Sanscrit slokas, copy of which I subjoin, asserts that Simroun was founded by NÁNYUPA DE'VA,

A. D. 1097; that six† of the dynasty reigned there with great splendour; and that the sixth, by name HARI SINHA DE'VA, was compelled to abandon his capital and kingdom, and take refuge in the hills A. D. 1322. The Moslem annals give 1323 for the date of the destruction of Simroun by TOGLAK SHAH. Of the accuracy of the latter date there can be no doubt; nor is the difference between the Musalmán and Hindu chronology of the least moment. But, unless NÁNYUPA had more than five successors, we cannot place the foundation of Simroun higher than about 1200 A. D. That is *clearly* too recent; and, in fact, no part of the tradition can be trusted but that vouched by the memorial verses, which only give the date of *destruction*.

Memorial verses of the founding and desertion of Simroun.

रामस्यवित्तंनलराजवित्तं पुरूरवोवित्तमलर्कराज्ञ :
ह्रदात्समुद्धृत्यनिषात्यनागं श्रीनान्यदेवोनिरमात्स्व गर्त्तम् । १ ।
वाणाक्षियुग्मशशि सम्मित शाकवर्षेपौषस्य शुक्लनवमी रविसूनुवारे ।
त्यक्त्वास्वपट्टनपुरं हरसिंहदेवो दुर्दैवदेशितपथाथगिरिंविवेश । २ ।—

The following is a literal translation of these memorial verses:

'The wealth accumulated by Rájás RÁMA, NALA, PURURAVA, and ALARKA, was preserved in a tank (that of Isrá), and guarded by a serpent. NÁNYUPA DE'VA destroyed the serpent; appropriated the wealth; and built (Simroun) Garh with it. (His descendant) HARI SINHA, compelled by cruel fate, abandoned his beautiful city, and went to the hills in the year of the Saka 1245.'

The kingdom of the Déva dynasty in the plains expired with the destruction or desertion of Simroun. It extended from the Kosi to the Gandak, and from the Ganges to the hills of Nèpal: at least, such were its limits in the days of its greatest splendour, when consequently it embraced *all* the several localities from which I have recently forwarded to you such signal memorials of Hindu power and science.

II.—*Further particulars of the Sárun and Tirhut Láths, and Account of two Buddha Inscriptions found, the one at Bakhra, in Tirhut, the other at Sárnáth, near Benares.* *By* JAMES PRINSEP, *Sec. As. Soc. &c.*

[Read at the Meeting of the 11th March.]

The following note, from Mr. HODGSON, (alluded to in the preceding article,) accompanied the drawings of Buddhist monuments, which had been promised to the Society in his letter, read at the meeting of the 28th May, 1834.

† 1, NANYUPA. 2, GANGA. 3, NARA SINHA. 4, RA'MA SINHA. 5, SAKTI SINHA. 6, HARI SINHA, all with the cognomen *Déva*.

Inscription on the Pillar at Radiah in the Sárun district

(The inscription on the Delhi column contains 11 lines more)

Note. the small letters between the lines are taken from the Delhi inscription. letters not found in that version are surrounded by a line [ ]. and those wanting in the present version are inserted with a caret ^.

"I have at last the pleasure to send you my drawings of the Bakhra column, and the Rádhia column, with their inscriptions, and a third of the Kesriah mound, surmounted with its hemispherical temple or Dehgope. I trust you will animadvert severely upon the barbarous custom of cutting cyphers and names upon these ancient monuments—if there were any inscription on the Bakhra column, it must in this way have been scribbled over and destroyed."

At one of the very earliest meetings of the Asiatic Society, held on the 29th January, 1784, I find by the records, that Mr. LAW presented "A Short Account of Two Pillars to the North of Patna." The paper does not seem to have been printed, nor has it been preserved among our archives; we may therefore conclude, that it was of a merely cursory nature: nor could we be certain to which of the three pillars, now again brought to our notice by Mr. HODGSON, the remark applied, were it not that the Bakhra pillar of Tirhut, and the Rádhia or Arahráj pillar of Sárun bear too palpable evidence of the visit of Europeans, in the names engraved over the surface of the stone. In the former we find the names of C. H. BARLOW, 1780, General BRISCO and others in 1799;—in the other at the foot of the original inscription is inscribed the name of REUBEN BURROW, 1792. This practice of scribbling over and disfiguring ancient monuments is as barbarous as the vain-glory of JEHANGIR, evinced in the zone of Persian cut over the Allahabad inscription; but fortunately in the case of the Bakhra column, it seems to have been harmless: for there are no traces of an ancient inscription upon it, at least on the parts of the shaft above ground. Such Nágarí characters as appear in Mr. HODGSON's facsimile are all modern, and record merely the names and dates of native visitors as gothic as their European precursors.

It is quite unnecessary, therefore, to give an engraving of the Bakhra transcript furnished by Mr. HODGSON. The view made by his native artist (see Pl. VII.) is very faithful, and entirely accords with two already in my possession, one by Mr. R. H. RATTRAY, the other by Mr. J. STEPHENSON*, whose accurate description of the monument, and of the marks of an ancient city in the neighbourhood, as well as his discovery of a Buddhist image there, form the subject of a very interesting note, already submitted to the Society, and to which I shall presently allude.

Passing then to the Rádhia or Sárun Láth, which is evidently the one alluded to by Mr. STIRLING, (and not the Bakhra column, as Mr. HODGSON supposed, for the latter bears no inscription,) it is satisfactory to discover that this pillar is in very good preservation, although it has lost its capital and surmounting *Sinha* or lion; for

* Dr. MILL has also favored we with a sight of two paintings of the same column made by a native artist for Mr. J. R. ELPHINSTONE in 1814.

it bears a long inscription in the Allahabad character, No. 1, which, upon a careful comparison with the plates of the 7th volume of Researches, is also identical with that of FÍROZ's Láth: so that we are now in possession of four copies of the same inscription, three of them perfect, viz. the Delhi, the Mattiah, and the present one, and that of Allahabad mutilated. The dimensions of the Rádhia Láth, are thus given by Mr. HODGSON's artist: (see Pl. VII.)

	ft.	in.
Height from the ground to the top of the shaft, ...	39	0
Circumference at the base, ...	11	2
Ditto, at the summit, ...	8	0

Its locality is described in the Persian memorandum as in the village of *Púrnia*, پورنیا near *Arahráj*, ارہراج zillah *Sárun*. I find in ARROWSMITH's map, a place called Purownah, between Gorakhpur and Bettiah, which may probably be the spot indicated; for Mr. HODGSON himself states it to be at Rádhia, near Arahraj-Mahádeva, in the district of Majhuah, in the zemindáry of Bettiah, (JOUR. Vol. III. p. 483.)

Mattiah, the site of the third pillar, is, by the map, a good way farther to the north.

In my notice on the latter pillar I mentioned that it wanted the last eleven lines of the Delhi version. The same omission occurs in the present copy; which corresponds also in some other respects with its neighbour, such as in having double letters, or letters superposed where they are single on FI'ROZ's Láth:—in having the half-moon letter in lieu of the triangle; in the frequent omission of the initial letter ꣡, and the addition of the final inflection ꣣ (See Vol. III. p. 485). The suggested order of the reading, on FI'ROZ's Láth, namely North, West, South, East, is also confirmed.

Being now in a condition to correct the few errors of the Delhi version, by collation with two other, and in many parts with three, authentic texts, I propose immediately to lithograph a revised copy of it, to assist in the elucidation of this very curious monument of antiquity; while, in the meantime, I now annex a facsimile of the Sárun version, (Pl. VIII.) with interlineary notes of its chief variations from the standard text, to be consulted in any case of disputed reading.

With regard to the architecture of these columns, it has been pointed out to me, that Lieut. BURT's drawing of the Allahabad column did not render justice to the ornamental work on its capital, which has a decidedly Greek appearance. That officer proves also in error (as was suspected by Mr. HODGSON) in supposing the mutilated figure on the summit to have been a *bull*. I have been favored with the following note on the subject from Lieut. KITTOE, whose architectural taste and

peculiar study of the ornaments of Hindu and Muhammedan buildings in such parts of India as he has visited, will, we may hope, hereafter contribute to our better acquaintance with the detail of oriental architecture of various epochs.

" On perusing No. 27 of the Asiatic Society's Journal, for March, 1834, I observed a long treatise on the Allahabad column, which has been lying partly buried since 1804, when wantonly taken down by that enemy to Hindustaní architecture, Colonel KYD, at which time the capital of it (of which I am about to treat) was destroyed.

" I obtained my information from a very old inhabitant, a Musalman classie, who had seen the obelisk erect, opposite the inner gate-way of the Jumná Durwázá; he informed me, that a figure of a lion was on the capital before it was destroyed.

" I am sorry to say, that from absorption of damp and saltpetre, the outer crust is fast caking off, carrying the inscriptions with it; though, at the fiat of the commandant of the garrison, a working party of a couple of hundred sípahís could be sent and the column placed on stone trucks, or on logs of wood cut for the purpose, and thereby be saved from further destruction.

" My attention was first drawn towards this monument of antiquity by the uncommon ornament on the periphery of the mutilated capital, of which I enclose a rough though correct sketch, (fig. 4, Plate IX.) and upon examination, I found that Lt. BURT's bull was once a figure of a lion couchant, the claws in each paw being very plain; and the square shape in which the chest is cut between the forelegs, led me to a supposition that there had been a like figure to the colossal representation of the lion and elephant on the bridge at Jaunpur, and which was found in the ruins of the fort there, during the repairs of the bridge by Capt. MCPHERSON, who placed it on a pedestal—(if acceptable I will at a future period send a drawing and description of it*.) I am the more convinced of the correctness of my conclusion, since the perusal of October's number of A. S. Journal, in which a drawing and description of the Mattiah Láth is given, on which precisely the same figure occurs, the elephant excepted.

" The ornaments on the periphery of the block will be found to resemble those common in the cimarecta of Grecian cornices; the astragal or beading of it is also of common occurrence in Grecian and Roman architecture.

" On comparing Lieut. BURT'S copy of the character No. 1, I observed several errors in the shape of the letters, and in their actual number; this however has become of no moment since your discovery, that the three inscriptions of the Delhí, Pryag, and Mattiah pillars are each other's facsimiles.

" However, there is one omission, I consider, of great importance;—that of the interlineation of nearly the whole character No. 1, with one more modern, like unto No. 2, and which may probably be a translation into Sanscrit of the former; it is cut or rather dotted in a very rough manner, and in some places the letters join into those of No. 1, to which I attribute the errors in the copy of that character.

" I shall here conclude by remarking, that the number of lines effaced by JEHANGÍR's pedigree are seven, by correct measurement; whereas three are the number mentioned: this may probably be a misprint."

* We shall esteem this a favor. There was however no elephant on the Allahabad column.—ED.

on his shoulder as a *bhangí*, laden with two hills. The bhangi however broke with the weight near to the spot where the pillar stands, and two hills or mounds were there left by *Bhim Sinh*, and remain to the present day, and are to be seen, one near the pillar, the other at a distance of a few hundred yards.

"Many years after this happened, the spirit of the place appeared to a Bengalí in a dream, and informed him that there was immense treasure buried under the pillar in copper *handís* or vessels bound with chains. The spirit requested him to take a journey or pilgrimage to the spot and possess it. The Bengálí travelled to the place, and found the pillar a few feet above the ground, in the middle of a large jungle, inhabited by wild beasts of every description. However, notwithstanding the danger, he began to clear away the jungle, and dig for the treasure. At a great depth, he came to a well or small tank, on the surface of which floated a large silver *choki* (or seat), and through a hole in the middle, the pillar descends down into the water to an unknown depth. By the side of the well are stationed two *swáms* (large black bees), the size of a man's fist, to protect the place and treasure. The Bengálí entered this sanctuary, disappeared, and was never heard of more. The pillar after this affair rose to the height of two *tádí* trees, and has since been sinking at the rate of an inch annually. Many years after the Bengálí's disappearance, an English gentleman came to the place and dug down to discover the base of the pillar, but when he came to the silver *Choki* he was attacked by two *swáms*, one of which stung and killed him on the spot: since that time, no one dare venture to dig below the pillar, which has subsequently remained unmolested."

It is easy to reconcile some parts of this tradition with natural causes. For instance, that the place has at no distant period been a jungle, inhabited by wild beasts, is very probable; for several that have been known to avoid the habitations of man are now found on the spot, unwilling to quit their ancient haunts. On the elevated part of a heap of brick rubbish a porcupine has now its den: four holes lead to its tenement, which is situated at a great depth below. The quantity of earth and brick rubbish this animal had thrown to the surface might strengthen the idea that the den had been made by a larger animal, had it not been frequently seen by the natives who live close to the spot, one of whom endeavoured to capture the animal, but his formidable armour proved too sharp for the man's hands and arms, and he escaped into his den with the loss of a few quills, which I purchased of the hardy hunter for a few pice.

A few yards to the north of the pillar stands a mound or tumulus of solid brick-work, of a conical shape, similar to the one above described, near Bassar: the top is surmounted by a large pípal tree, to all appearance many centuries old. The outward parts of this mound are dilapidated by time. The bricks it has been built with are a foot square, and have been well burnt; mud has been used in place of mortar. On the north side an excavation has been made to the very centre, by a doctor (as I was informed), resident at Mozafferpur, 30

years ago, whose name I could not ascertain. The doctor, however, (according to a native's account, who assisted in the work,) found no treasure, but only a well of great depth, situated immediately under the centre, which I could not find any vestige of, although I made a search for it. At present a Hindu *Faqir* has availed himself of the doctor's labours by converting the extremity of the excavation into a place of worship, making a few images of clay, and fixing them to the sides of the cavity.

One of these images, coloured black, attracted my notice from its singular grotesque appearance: on closer inspection, I discovered that the lower part was of stone, finely sculptured, and altogether different from the upper which I found to be made of clay. I succeeded in purchasing the deity from the Faqir for two rupees, and after washing, picking, and separating the outward covering of clay, in an adjoining tank, a fragment of beautiful ancient sculpture was brought to light. On further inquiry, the *Faqir's* artfulness was detected by a person present, who recognized the fragment to have been found by the zemindar of the place when digging among the ruins for bricks to build his present *pakka* house, a few hundred yards distant. This fragment of sculpture represents the lower part of a figure of Buddha, sitting cross-legged, according to the custom of the east, with the arms resting across the upper part of the thigh. On the soles of the feet (which are turned up), and on the palm of the left hand, is represented the lotus flower*. The back of this fragment is beautifully sculptured, with two lions standing in an erect position, upon two elephants. On each side of the base is cut a lion half couchant with a small female figure in the centre. The stone is the same as that of the pillar, viz. a red fine grained sandstone, very hard. On the lowest part of the fragment is an inscription in Sanscrit, which the Pandits of this part of the country cannot as yet decypher.

I have no doubt but this fragment is coeval with the pillar, if not connected with its history.

Note on the above by J. P.

The mutilated image thus fortuitously rescued by Mr. Stephenson, and by him presented to the Asiatic Society, is represented in Plate IX. The inscription around the pedestal, which had baffled the pandits of Tirhut, excited considerable curiosity on its exhibition to the Society, from the circumstance of none of the ancient Buddhist images in our museum, whether from Benares or from the Bhágelpur hills, possessing such a characteristic.

* The emblem always borne by a Chakravartti, or universal sovereign, and à fortiori by Buddha.—Ed.

A singular coincidence shortly after served very materially to increase the interest thus raised regarding this short and otherwise trivial inscription.

It may not be generally known to the members of the Society, that some of my Benares friends, Captain THORESBY, Secretary of the Sanscrit College, Major GRANT, and Lieut. ALEXANDER CUNNINGHAM, of the Engineers, stimulated by the success of General VENTURA's operations in the Panjáb, have undertaken at joint expence with myself to open carefully the large Buddhist monument at Sárnáth*, so frequently alluded to in the Asiatic Researches, wherein it is conjectured from the evidence of some ancient inscriptions on copper, dug up near the spot, to have been erected by the sons of Bhupála, a Rájá of Gaur, in the eleventh century†.

Lieut. CUNNINGHAM, who is still zealously occupied in this interesting work, at such moments as his official duties will permit, has himself promised me a full account of his operations, when the whole shall be completed; but he has permitted me to anticipate him in mentioning the subject I am now about to introduce, should I be able to furnish a full explanation; which the sequel will prove to be the case.

At the depth then of ten feet and a half from the summit of the stone building, he extracted a slab of stone $28\frac{3}{4}$ inches long, 13 inches broad, by $4\frac{3}{4}$ thick, bearing an inscription in an ancient form of Devanágarí, of which, after referring in vain to the Pandits of the degenerate Kási, he sent me an exact facsimile by dák.

The stone was found lying with its head to the south-west, among the bricks and mud. It is of a pinkish hue, and all the letters are in excellent preservation.

Lieut. CUNNINGHAM remarked the similarity of some of the forms to the Sanscrit of the Manikyala coins, Plate XXI. figs. 10, 11; and to some letters of the Allahabad inscription, No. 2. in the second volume.

The facsimile, (represented on a smaller scale in fig. 2 of Plate IX,) reached me, as I have before stated, while the Tirhut image was under examination, and it immediately struck me from one or two prominent letters, as well as from the general appearance of the whole, that the

* It must not be supposed, that in this enterprize, the feelings of the natives are in any way offended. The Hindus are quite unconcerned about the tope, and the two sects of Jains in Benares, who are now at variance with each other, had joined in requesting me to open the building at their expence, that it might be ascertained to which party (Digambarí or Swetambarí) the enclosed image might belong. My departure from Benares alone prevented my satisfying their curiosity in 1830.

† See As. Res. vol. ix. pp. 74, 203; x. 130.

two inscriptions were substantially the same, although the characters of the two differed as much from one another as the Nágarí from the Bengálí alphabet. Upon shewing them to GOVIND RÁM SHÁSTRÍ, Mr. WILSON'S intelligent Pandit, and comparing the letters with the Tibetan and Gya forms of the Sanscrit alphabet, the identity of the two was confirmed, and several words made out, among them the titles "*Tathágata* and *Mahá Sramana*," both of an important Bauddha acceptation; but the context was devoid of meaning. The Pandit's meritorious efforts were communicated to our learned Vice-President, Dr. MILL, who, recognizing at once the form of the ancient *dh*, a semilunate letter, which had been taken for a *v*, was enabled to complete and give the true meaning of the inscription, with the exception of the initial word, which (in consequence of the stroke at the commencement) was read अयं *hic*, in the Sárnáth version, and एष, in the other sentence, instead of ये *qui*, in both. This mistake led to the reading of the word प्रभवो *prabhavo* in the singular, in lieu of प्रभवा in the plural, and connecting with it the word धर्म as part of the compound instead of धर्मा separately, thus:

अयं धर्महेतुप्रभवो हेतुं तेषां तथागतो ह्यवदत् तेषां च यो निरोध एवं वादी महाश्रमण॥

the interpretation of which was thus given by Dr. MILL:

"This is the generative source of the cause of meritorious duties. For the cause of these hath TATHÁGATA [or BUDDHA] declared. But as to what is the opposing principle of these, that likewise *doth* the MAHÁ SRAMANA [the great ascetic], declare."

The Tirhut inscription was found to differ only from the other in the substitution of two entirely synonymous words, the transposition of two others, and the omission of the particle *hi* "for," united to *avadat* in the second line. The translation of the passage was precisely the same. Introducing the corrections subsequently made, (as it is unnecessary to repeat the reading in its imperfect state) the text of the Tirhut image will stand thus in the modern Devanágarí character:

ओ ये धर्म्मा हेतुप्रभवा खेषां हतुं तथागत उवाच तेषां च यो निरोध एवं वादी महा श्रमणः।

We shall come to the corrected translation presently.

It was remarked that the latter part of the passage being in the present tense, as compared to *avadat* and *uvácha* in the former part, seemed to imply a continuation of the sentence; or, at any rate, left something inconclusive and unsatisfactory in the translation.

The circumstance, however, of two sculptured inscriptions found at distant places in terms of the same import, though varying in phrase

and in form of letter so much as to prove that one was by no means a mere copy of the other, suggested to my mind, that they must assuredly contain some very common text from the Bauddha scriptures, and I accordingly hastened to enquire of my friend Mr. CSOMA DE KÖRÖS, whether he had met with any similar passage, in his extensive examination of the Tibetan volumes.

He did not at first recognize it, but promised to bear it in mind; and sure enough, in the course of a few days, Mr. CSOMA brought me the pleasing intelligence that he had discovered the very sentence, agreeing word for word with the Sárnáth version, in three volumes of the Kah-gyur collection; being in Tibetan characters, according to their mode of writing Sanscrit, and without translation. Moreover on referring to the corresponding Sanscrit originals, in the Lántsha and in the modern Devanágarí copies of the same work (forming part of the treasures of Bauddha literature, made known to the world by our associate Mr. B. H. HODGSON) no less than fifteen examples were brought to light, of the verbatim introduction of the same text.

In all these instances it was found to occur as a kind of peroration, or concluding paragraph at the end of a volume. Thus, it is introduced at the termination of the first, second, and third *khanda* of the *Prajná Paramita*, (Tib. *Sher-chin,)* each containing 25,000 *slokas*; and again, at the end of the 5th *khanda*, which is an epitome of the *sata sahasriká*, or 100,000 *slokas*, contained in the four preceding sections*. In the Tibetan version the sentence is sometimes followed by the word བཀྲིས bkrís, a contraction for བཀྲ་ཤིས bkra-shís, "blessing, glory†," and sometimes by its Sanscrit equivalent in Tibetan characters མངྒལཾ, *mangalam*.

Something however was still wanting to remove the ambiguity of the abbreviated sentence, and this Mr. CSOMA's acute and assiduous research soon enabled him to supply; for in the མདོ *Do* class of the Kah-gyur, vol. ཉ or 9, leaf 510, he was so fortunate as to meet with the same passage connected with another Sanscrit *sloka*, in the Tibetan character, and followed immediately by a faithful translation into the latter language.

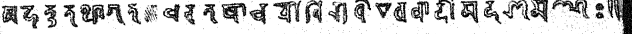
As the development of the passage has thus acquired importance, Mr. CSOMA has obligingly transcribed the whole from the Tibetan volume, first in Sanscrit, and below in Tibetan, with a literal version in the Roman character.

* See Mr. WILSON's account of the Kah-gyur. GLEANINGS, vol. iii. page 243, and JOURNAL, vol. i.

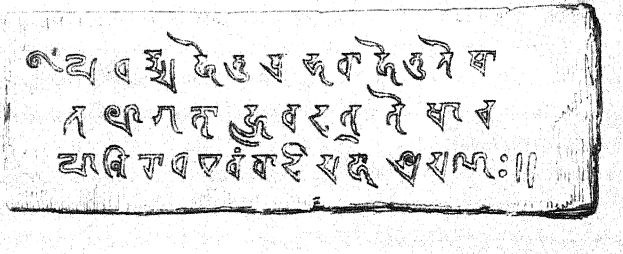
† See CSOMA's Tibetan Grammar, page 24.

Image of Buddha

dug up in the neighbourhood of the Bakhra Lâth. in Tirhut with an inscription on the pedestal



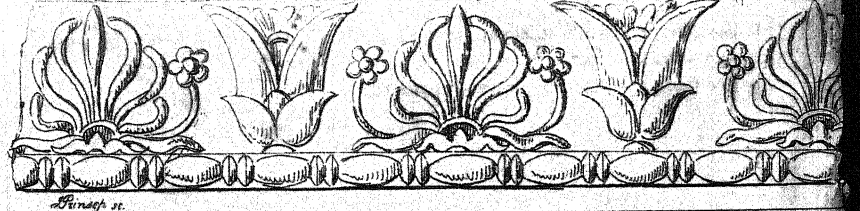
Inscription on a Stone extracted from the Sárnáth Tope. near Benares.



Inscription on a rock of the Mandara Hill. near Bhágelpur

Ornament on the periphery of the Capital of the Allahabad Lâth.

(See Vol. III. Pl. III)



Sanscrit version in Tibetan characters.

ཡེ་དྷརྨཱ་ཧེ་ཏུ་པྲ་བྷ་ཝཱ། ཧེ་ཏུཾ་ཏེ་ཥཱཾ་ཏ་ཐཱ་གཏོ་ཧྱ་ཝ་དད་ཧ། ཡེ་ཅྩ་ཡོ་གི་ཤྲ་མ་ཎཱཿ ། སརྦ་པཱ་པ་ཡཱ་ཀ་རཱ་ཎཾ། ཀུ་ཤ་ལ་ཡོ་པ་ས་པ་དཱ་དཾ། སྭ་ཙི་ཏྟཾ་པ་རི་ད་མ་ཏཾ། མོ་ཧཱ་ན་ཏྟ་ཏ་ཀྟ་ཱ་ནུ་ཤཱ་སན་ཾ ། *

Yé dharmá hétu prabhavá, hétun téshañ Tathágató hyavadat,
Téshán cha yo nirodha, èvam vádí Mahá Shramanas.
Sarva pápasyákarani (? *am*), kushalasyopasapradam,
Sva chittam paridamanum, ètad Buddhánushásanam.

Tibetan Translation.

ཆོས་རྣམས་ཐམས་ཅད་རྒྱུ་ལས་བྱུང་ ། དེ་རྒྱུ་དེ་བཞིན་གཤེགས་པས་གསུངས ། རྒྱུ་ལ་འགོག་པ་གང་ཡིན་པ ། འདི་སྐད་གསུང་བ་དེ་སྦྱོང་ཆེ ། རྟིག་པ་ཅི་ཡང་མི་བྱ་སྟེ ། དགེ་བ་ཕུན་སུམ་ཚོགས་པར་སྤྱད ། རང་གི་སེམས་ནི་ཡོངས་སུ་གཙལ ། སངས་རྒྱས་བསྟན་པ་འདི་ཡིན་ནོ ། ।

Chhos *r*nams thams chad *r*gyu las byung,
Dé *r*gyu de-*b*zhín *g*shegs-pas *g*sung,
*R*gyu-la *h*gog-pa gang yin-pa,
*H*di skad *g*sung-va *d*ge-*s*byong chhé :
*S*digpa chi yang mi bya sté ;
*D*gé-va phun sum tshogs-par spyad ;
Rang-gi semsni yongs-su *g*dul ;
Sangs-*r*gyas *b*stan-pa *h*di yin-no.

Here then was the solution of the enigma. The sentence thus frequently repeated was the preamble to the quaint compendium of the Buddhist doctrines, which was so universally known to the professors of this faith that it was no more necessary to repeat it on all occasions than it would be to insert the *gloria patri* at the end of each psalm in our own ritual. The sense was now seen to run on from the present tense of the second part of the sentence to the maxims which followed: and the whole passage was thus literally and intelligibly rendered from the Tibetan by Mr. Csoma de Körös.

"Whatever moral (or human) actions arise from some cause,
The cause of them has been declared by Tathágata :
What is the check to these actions,

* In the last two lines of this version M. Csoma proposes to read ཨ་ཀ་ར་ཎཾ *akaranam*, སཾ་པཱ་དཾ *sampádam*, and པ་རི་ད་མ་ནཾ *paridamanam*, which accord better with the sense of the Tibetan version. The marks for *i* and *am* ◌ི ◌ཾ are nearly similar, and are often misprinted in the Tibetan books : so also the subjoined *r* ◌ྲ is often confounded with the vowel mark *á* ◌ཱ.

Is thus set forth by the great SRAMANAS.

'No vice is to be committed:

Every virtue must be perfectly practised:

The mind must be brought under entire subjection;

This is the commandment of BUDDHA.'"

It is unfortunate that the Sanscrit text of the moral maxim has not been any where found in the Lantsá copy of the Prajná Parámita. Its authenticity rests, therefore, solely on the Tibetan version, in which there is apparently some error; for the sentence, as it stands, is not pure Sanscrit, and certainly will not bear the interpretation which Mr. CSOMA has given literally from the vernacular translation of Tibet. Dr. MILL has favored me with some valuable observations on the passage, which, with his permission, I here insert. Mr. HODGSON will doubtless be able to confirm the true reading by consulting the Sanscrit original of the དཔའ་བར་འགྲོ་བའི་ཏིང་ངེ་འཛིན *d*Pah-var *h*grovahi tiṅgé *h*dsin (Sans. *shúraṅgama samádhi*, the heroical extasy), which may still exist in some of the monasteries of Népal.

"The interesting discovery of the passage in the Buddhist sacred books from which the Sárnáth inscription is taken, by M. CSOMA DE KÖRÖS, removes all doubt as to the reading of the first word which I unfortunately took for the *demonstrative* pronoun ऋयं, whereas it is the *relative* ये to which the तेषां in the next line refers. It follows that the next word धर्मा should be read *separately* from the compound हेतुप्रभवाः which is of course plural. M. CSOMA'S version is here perfectly agreeable to the Sanscrit; and my translation of the former half of this sentence requires to be corrected by his.

I am by no means equally well satisfied with the *other* sentence quoted by M. CSOMA as following the former in *some* of the places where it occurs in the Buddhist scriptures: the Sanscrit text of which is certainly corrupted in the copies he cites, and, except in the last line, exhibits no sentence corresponding in form to his Latin or English version. I have also very considerable doubt of the accuracy of the opinion, that this second stanza is the clue to the supposed enigma in the first, or necessary in any respect to complete its meaning. That it is even the object of reference in the former stanza, appears to me doubtful. The occurrence of the former passage,—not only in the two several inscriptions of Benares and Tirhut, by itself,—but at the end of chapters in the places you pointed out to me from M. CSOMA'S Lantsá MSS., seem to indicate that it has a complete meaning in itself: and the एवं "thus" or "alike" of the fourth line may as well be understood with reference to the preceding clause, as to any sentence following. The metrical structure of the two passages confirms me in the idea of their independency: the latter being in the ordinary *Anustup* measure, with about the same degree of license as we find that measure in the Puránas: whereas the former, though approximating in places to the measure of eight syllables, is as remote from the rules of VALMIKI'S sloka as are the hymns of the Vedas: and it is equally irreducible to the laws of the *A'rya* or any more modern poetical measure.

In the translation of the latter passage, I would advert particularly to the line which M. CSOMA has translated, 'Every virtue must be practised.' I do not see how

the Sanscrit, however amended, can bear that meaning. The first word, *kusalasya*, ordinarily means ' of felicity,' or else, ' of skill and cleverness :' while the other word, which, coalescing with *kusalasya*, makes up the whole line, is certainly not Sanscrit in its present state ; for there is not, and cannot be, any such compound as उपसम्पदं. By making the two last letters म्पद्: i. e. m*padas* instead of *pradam*, (which however seems clear in the Tibetan character), and reading the last word of the first line करणे instead of करणं, I obtain the meaning,

' In the abstinence from [lit. non-doing of] all sin, *is the attainment of felicity*.'

A third meaning of *kusala*—though much less used among brahmanical Hindus —is pointed out in the *Nána-artha-varga* of AMARA-SINHA, who was himself a Buddhist, in the following line, (*Kósha*, lib. iii. c. 4, s. 23, l. 206,) which may furnish us with an approximation in ultimate meaning, though not in the structure of the sentence, to the Tibetan explanation given by M. CSOMA.

पर्य्याप्ति क्षेमपुण्येषु कुशलं त्रिषु चिषु

" Accomplishment, happiness, holiness : in these three meanings is the neuter noun *kusalam* learnedly understood."

Adopting the last of these three senses, that of *punyam* or sanctity, and taking the word *upasampadas* in a sense which the Buddhist* use of the term points out, we may render the second line in question like pos—

" The advancement, or l—ts connect—nt, of purity."

The third line requires the omissio—ue and cont—*svára* over the *tt* of the word *chitta*, to make it good Sanscrit, viz—se travels is—ugation of one's own mind,' स्वचित्तपरिदमनं ; unless, retaining th—loes, thou—we altered the other word from *paridamanam* to *paridamaníyam*, —ght but exc— mind must be subjugated,' स्वचित्तं परिदमनीयं. I think the choic—e island—we—between these two readings, of which the former seems the best, and—ar penny wc—t with the last line, as well as with the rules of Anustup measure.

I subjoin a literal version of both the st—incense, amb—to my notion of them, dropping however the proposed emendation —करणि in the first line of the latter, and adopting the reading—pear, there is—roposed by M. CSOMA. which at th—

ये धर्मा हेतुप्रभवा।	æ officia *exstant in*-causâ-*qud*-
हेतु तेषां तथागतो ह्यवदत्।	of the *originem-habentia*,
तेषां च यो निरोध।	—m eorum SIC-PROFECTUS *ille* (Buddhas) quidem declaravit.
एवं वादी महाश्रमणः।	Eorum que quod obstaculum *exstat*,
	Ita *quos* —e dicens MAGNUS ASCE-
सर्वपापस्याकरणं।	TIC—
कुशलस्योपसम्पदः	Omnis-pec—ati renunciatio,
स्वचित्तपरिदमनं।	Sanctitatis profectus,
एतद्बुद्धानुशासनं।	Proprii-intellectûs subjugatio,
	Hæc est BUDDHÆ-disciplina."

Dr. MILL's conjectural emendation of the 2nd line of the second of these stanzas, has been since unexpectedly confirmed by the Singhalese

* The word *upasampada* is technically understood of the superior order of the Buddhist priesthood, the supply of whi— when it had become extinct in Ceylon, has frequently been an object of solicitud— the more religious of the Candian monarchs, and has even been the occasion of embassies to Siam. For the attainment of the order, the possession of 227 separate *gunas* or virtuous qualities is requisite : each of which is distinctly mentioned in their treatises concerning ordination.

Christian convert from Buddhism, RATNA-PÁLA: who repeats both passages in the Páli or Prácrit form from memory—describing the former especially as universally current among the disciples of Buddha. His reading, however, gives *upasampadá* (Sanscrit उपसम्पद्: *profectús)* in the plural. And in the former passage, that of the inscription, he omits the particle *hi,* and instead of the verb *avadat* or *uvácha,* he reads the synonymous *áha.* His Páli reading, which will be immediately recognized by scholars as good Magadha Prácrit, is as follows:

> *" Ye dhammá hetuppabhavá Tesán hetun tathágato*
> *A'ha tesan cha yo nirodha: Evan vádi mahá samana.*
> *Sabba pápassa akaranan: Kusalassa upasanpadá:*
> *Sa chitta paridamanan: Etan Buddhanusásanan.*

but RATNA PÁLA says that the latter couplet is not necessarily connected with the former. On the contrary another series of verses generally follows it in the daily service of the Buddhist temples of Ceylon.

The compendium of the precepts of BUDDHA certainly occurs in numerous instances without the previous couplet. Thus it is inserted in the Tibetan version of th[illegible]tter to RATNAVÁLÍ, given as one of the examples in Mr. *gama samá*[illegible]new Grammar, which will also be found among the extract[illegible]he monaste[illegible] in the third volume of this JOURNAL, page 61; and ther[illegible]age in the Bu[illegible]ave been no reason to suspect that it was implied in the in[illegible] CSOMA DE [illegible]unfortunat[illegible]entence engraved on the Tirhut and Sárnáth tablets, had [illegible]*ative* चे to w[illegible]ual text been found by our learned Hungarian guest, to [illegible]word धर्मा s[illegible]ous and willing investigation of the volumes which are [illegible] is of course [illegible] but himself, we are mainly indebted for this probable if [illegible]anscrit; and [illegible]e solution of the enigma.

[illegible]orrected by his

IV.—*Report on the* satisfied wit*ocotra. By Lieut.* J. R. WELLSTED, *In some* of th*g, Assistant Surveyor.*

The following Report which[illegible]been compiled from a daily journal, containing copious notices of all that came under my observation during a deputation of two months on the island of S[illegible]cotra, under orders of Lieut. HAINES, commanding the Palinurus surveying [illegible]rig; but as the admission of minute details, illustrative of either the condition and character of the inhabitants, or the productions, topography, &c. of the Island can scarcely be deemed necessary in an official paper, similar to t[illegible]t which by my instructions is required of me in this instance, I have considered it necessary to condense the whole into as brief a space as *has appeared* consistent with the objects therein specified, notifying at the same time, that I have preserved the original notes, in the event of Government requiring either more detailed or extended information on the various points to which my attention has been directed.

By separating the various subjects co[illegible]tained in this paper into sections under different heads, I trust the Right Honorable the Governor in Council will be enabled, without wading through any extraneous matter, to seek at once the species of information which he may require.

The Island of Socotra appears to have been known at an early period to the ancient geographers. PTOLEMY notices it under the appellation of Dios Cavedis Ins: and ARRIAN specifies, that the inhabitants of it were subjected to the authority of the kings of the Incense Country; but from this period it appears to have attracted little attention, and may almost be considered as lost to Geography, until the visit of MARCO POLO in the 13th century, who does not however make any particular mention of its inhabitants or resources. VASCO DA GAMA, in his memorable voyage from Lisbon to Calicut in 1497, passed Socotra without seeing it; but seven years afterwards, it was made known to European navigators by FERNANDEZ PEREIRA; and ALBUQUERQUE, at a somewhat later period, took possession of it. At the commencement of the 17th century, when the increasing spirit of commerce and enterprise led several of our squadrons to enter the ports in the Red Sea, Socotra was frequently visited for shelter or refreshment; and in consequence of a general belief during the year 1798, that BUONAPARTE, who was then in Egypt, contemplated a junction of his forces with those of HYDER ALI in India, Commodore BLANKET, with a squadron from the Cape of Good Hope, was dispatched to take possession of it*. But notwithstanding these several visits, our accounts connected with its inhabitants, appearance and produce, have been vague and contradictory. By one traveller, Captain DAUNTOUN, a notice of whose travels is in my possession, it is observed, that "its chief produce is aloes, though the annual amount does not exceed a ton—cattle may be bought but exceedingly small, according to the dry rocky barrenness of the island—wood at 12 pence a man's burden, every particular is a very dear penny worth." By another, it is described as a populous fruitful island; that the inhabitants trade to Goa with its produce, viz. fine aloes, frankincense, ambergris, dragon's blood, rice, dates, and coral.

Inconsistent as these statements appear, there is reason to believe both may have described with fidelity that which at the period of their visit was presented before them. Independent of the evidence which exists as to the former fertility of the island, it is necessary to consider, that those parts which would be exposed to the view of the passing traveller are mostly naked limestone, parts of which are indeed covered with a scanty sprinkling of soil, but that of a quality so hard and bad, that it merely nourishes a feeble grass, which dries up almost as soon as the rain ceases, which may have caused it to spring forth. Upon our first arrival at Tamarida, in the early part of January, some recent showers had clothed the hill with a lively verdure to the very base of the granite spires, and the whole looked fresh and beautiful; a month afterwards all was parched and barren.

More than one vessel at different periods had been dispatched to examine the nature of its harbours and anchorages; but owing to some cause which I cannot explain, our information on these points could in no higher degree be depended on. Our ignorance on these subjects strikes us the more

* These and the other scanty notices found in this paper, are extracted from books in my possession on board; other information will of course be found in works to which I have it not in my power at present to refer.

forcibly when we consider the position of Socotra, its lying directly in the route of the trade from India, by the way of the Red Sea: the entrance to which, it may be said to command on the one hand, and close to the track of our ships by the way of the Cape on the other—a position, the advantages of which under an enterprising population and enlightened government, could scarcely have failed at some period to have brought it into great commercial notice and prosperity. In periods of antiquity, Socotra served as a station for merchants ; and it may be observed, that these advantages were not over-looked by a maritime nation like the Portuguese. The ports which remain in the vicinity of Tamarida still attest the importance which they attached to its possession; but since the decline of their power, at the conclusion of the sixteenth century, Socotra has continued to be disregarded by European nations.

At the commencement of this year, various causes combined to render the establishment of a steam communication between India and Europe an object of general interest, and discussion ; and the attention of Government became particularly directed towards this island, along the shores of which it was anticipated, that some well-sheltered harbours might be discovered, which would serve at all seasons as a depôt for coals. In order to determine this point, Captain HAINES in the Palinurus Surveying Brig was directed to proceed at once to the island, and to execute a minute trigonometrical survey of its exterior, while his attention at the same time was called to "obtaining the fullest information regarding the government, population, produce, fertility and quality of soil, as well as the religion, customs, manners, and wealth of its inhabitants." While Captain HAINES should occupy himself with the former of these duties, confining his observation to the sea coast and its vicinity, I was directed to proceed towards the interior in order that I might, from personal observation, report on the various subjects on which Government was desirous of possessing information.

Providing myself with camels, and a guide, I first journeyed by the interior towards Colesseah, examining the greater part of the western portion of the island. After concluding my observations in this neighbourhood, and communicating with the ship, I returned to Tamarida. A chief, in the mean time, named HAMED BEN TARY, arrived at Colesseah, who after leaving most positive directions, prohibiting our further progress, again left for the continent. We were in consequence closely confined to the town for a few days, but I at length got clear and completed my survey of the western end. The map will best exhibit the nature and extent of these journeys, and I shall not enter into any detail of them here, or make any other remarks than that the Arabs were unceasing in their attempts to throw obstacles in the way of my completion of it.

The Island of Socotra is of the shape of an acute triangle, having for its vertex, a flat promontory towards the east called Ras Mamse; the coast line on the other side runs in a S. W. direction, and is nearly straight ; the general direction of the northern face is formed by a succession of small bays; the base is also indented by a deep bay. Its length is 71½ miles, and breadth at the broadest part 21½ miles. The whole island may

be considered as a pile of mountains of nearly equal height, which are almost surrounded by a low plain, extending from their base to the margin of the sea: this is of an irregular width, varying from 4 to 2 miles, excepting that between Ras Kattany and Ras Shab, where the mountains rise up perpendicularly from the sea, and it there disappears altogether. Throughout the whole extent of this belt, with the exception of those parts which are watered by the mountain streams in their progress towards the sea, and some spaces hereafter specified, the soil is hard, and of a bad quality, and does not, in its present state, appear susceptible of cultivation. The southern side, though considerably less fertile than the northern, affords, nevertheless, in the vicinity of Ras Mamse many of its productions; but to the westward, it is as arid and barren as the worst parts of Arabia. There the force of the S. W. wind has blown the sand up from the sea shore, where it is so fine as to be nearly impalpable, and formed it into a continuous range of sand hills, which extend parallel to the beach for several miles: from hence it spreads over the plain, and is even in some places deposited in vast quantities, at a distance of three miles from the sea, at the base of the mountains, which there form a barrier that alone could prevent it from overwhelming the natural soil of the whole island on the northern side. This belt is stony, and is covered with a dwarfish bush about six feet in height, the foliage of which is retained throughout the year, and gives to the space, when it is grown, an appearance of being clothed with verdure. Such is the appearance of the sea coast; but the high lands exhibit a great variety of soil and surface. As a general remark, it may however be observed, that nothing in the N. E. monsoon presents a stronger contrast than the western and eastern parts of the island; while the former is destitute of verdure, has but scanty pasturage, and has (with the exception of a few places near the sea) no other water than that which is retained in natural reservoirs; the latter or eastern portion is fed by numerous streams; its valleys nourish luxuriant grass; herds of cattle are numerous, and the scenery in some places little inferior to that of our own country.

But we must now, as the most central and lofty, examine the granite range of mountains in the vicinity of Tamarida; steep valleys intersect this chain, dividing it into narrow ridges, which extend in a north-easterly and south-westerly direction. Of these the lower part is composed of a red aluminous porphyry, and the upper of a coarse-grained grey granite which protrudes several of its spires to the height, as was ascertained by a trigonometrical admeasurement, of five thousand feet; the summit of these is consequently seldom free from clouds; but when the weather is clear, their appearance is broken and picturesque. The lower part of this chain is covered with the same dwarfish tree which is found on the plains: higher up there is a great variety of trees and aromatic plants; but the granite spires merely nourish a light-colored moss, and are destitute of verdure. Connected with the granite range, and extending from it to the S. W. there is a lower ridge, averaging in height about 1500 feet, composed of a compact cream-colored limestone. From this the hills diverge

in short ranges towards the southern shore: their outline is mostly smooth and rounded, excepting on the side nearest to the sea, where it in general presents a steep wall. The whole of the western and the greater part of the eastern portion of the island is composed of hills similar in their appearance, elevation, and structure to this range.

As the whole Island of Socotra may be considered as one mass of primitive rock, we cannot expect to find it distinguished by any remarkable fertility of soil. I yet find it so varied, that it is difficult to speak of it in any general terms. The summit and sides of the greater part of the mountains, composing the eastern portion of the island, present in some places the smooth surface of the rock entirely denuded of soil; in others the rain has worn the surface into hollows, and other irregularities, in which there is lodged a shallow deposit of light earth, from whence a few shrubs spring forth. On the sea face of the hills, on the northern side of the island, and amidst the sides and elevated regions in the vicinity of the granite peaks, we find a dark rich vegetable mould, which teems with the most luxuriant vegetation. In the plain about Tamarida, some portions near Cádhiqu, and several beautiful valleys and plains which I crossed on my return from Ras Mamse, the soil consists of a reddish colored earth, which nourishes at certain seasons an abundant supply of grass, and appears well adapted for the cultivation of grain, fruits, or vegetables. In those valleys through which the streams flow, there are now only extensive groves of date trees; but the existence of a broad border of beautiful turf, occasional enclosures of Dekhan, and (though but rarely) a plantation of indigo or cotton, indicate no want of richness or fertility of the soil.

Climate.

Though this island is situated but a short distance from the continents of Arabia and Africa, and is in fact on the same parallel with their most parched and burning plains, yet from both monsoons blowing over a vast expanse of water, it enjoys a climate remarkably temperate and cool: a register of the thermometer which I kept during our stay, from the 12th of January to the 14th March, exhibits the mean daily temperature at 70½°, while several springs at but a slight elevation from the sea, into which the thermometer was immersed, indicated the mean annual temperature at 73°. On the hills it is of course found to be much cooler. Until within a few days previous to our quitting the island, the monsoon blew very fresh, and even at times swept through the valleys with a violence I have rarely seen equalled. The sky was usually overcast with clouds, and while other parts of Asia and Africa, under the same parallel, had yet some months to elapse before their termination of the dry seasons, Socotra enjoyed frequent and copious rains; for these she is principally indebted at this season to her granite mountains: their lofty peaks obstruct the clouds which strike against their sides: either depositing their aqueous particles near their summit, or precipitating them in plentiful showers on the surrounding country. It is these also which contribute to nourish the numerous mountain streams which intersect several parts of the island. Several

of these are of a width and depth that in Arabia would almost entitle them to the appellation of rivers. They all originate near the granite mountains, and rolling with a considerable descent down the rocky ravines, they generally unite several with each other near their extremity, and afterwards wind their way more slowly through the valleys into the sea. Those on the western part of the island have a rapid descent, and are in the N. E. monsoon dried up, at but a short distance from their source, while those on the eastern side continue throughout the year to discharge their waters into the ocean.

I could learn but little concerning the influence of the S. W. monsoon here from the natives. They describe the rain as being frequent and heavy, and the showers in July and August nearly incessant. No buggalows at this season touch at their island, nor do any of their own boats venture to sea. The trees, wherever the wind has reached them in their inclined and beset position, bear good evidence to its power. Thunderstorms are frequent at the setting in of the monsoon, and accidents from the lightning are described to be of frequent occurrence.

Natural Productions.

Among the few natural productions which are found on this island, that which holds the first rank is the aloe, "*Aloe spicata*, and *Aloe Socotrina*," called in the language of the island Tayof, and by the Arabs Subal, for this plant has been held famous from the earliest periods and it is consequently too well known to need any description. They are usually found on the sides and summits of the limestone mountains, at an elevation of from 500 to 1000 feet from the level of the plains. The plant appears to thrive only in parched and barren places. Its leaves are plucked at any period, and after being placed in a skin, the juice is suffered to exude from them. In this state they are brought in to Tamarida and Colesseah, and there disposed of for dates. From hence it is mostly shipped off to Muscat, where its price varies very considerably. In 1833, the best sold for one rupee the Bengal seile (seer?), while of that which was more indifferent, five seiles might be procured for the dollar. The Socotrina aloes, when pure, are the finest in the world, but owing to the careless manner in which they are gathered and packed, they contract many impurities, and their value is proportionably deteriorated. Formerly every part of the island producing the aloe was farmed out to different individuals, and the whole produce at a fixed valuation was monopolized by the Sultán, who then resided on the island. The boundaries, which consisted of loose stone walls, and had been carried with immense labour over hill and dale, still remain under the present unsettled government; the descendants of the owners to whom they were allotted have either withdrawn their claims, or are forgotten. At present any one collects it who chooses to take the trouble, and not a grain is levied on account of the Sultan, as they lodge but little in ware-houses and merely collect it when the arrival of a ship or buggalow creates a demand. The quantity produced has been erroneously supposed to be much less than it is in reality; but on the western side of

the island the hills for an extent of several miles are now so thickly studded with it, that it is not likely even at any future period that the whole of that which might be, will be collected. The quantity reported within the last few years has varied very much; in 1833 it amounted to 83 skins, or about two tons. Next in importance to the aloe comes the Dragon's blood tree, *Pterocarpus Draco*, the gum from which, *Sanguis Draconis*, is also collected by the Bedouins at all seasons. As this gum is known to be produced by several trees, and the species on which it is found in Socotra may not therefore be known in Europe, I shall give a short account of it. Like the aloe it is usually met with on the limestone hills, rarely at a less elevation than 800, and sometimes as much as 2000, feet above the level of the sea; but it is never found on the plains. The trunk is usually about 12 inches in diameter, and its height varies from 10 to 12 feet; the branches are numerous, but short and thickly interwoven with each other. The leaves are of a coriaceous structure, and about 12 inches in length; they are of a sword-like form, pointed at the extremity, and somewhat extended at the base, where they are sessile and somewhat resemble those of the pine-apple. In this part they are connected with the branch of the tree, and radiating from it an indefinite number, they assume a fan-like shape. These together form the upper part of the tree, and by the variety in their shape and distribution, give rise to most fantastic appearances. We were not sufficiently fortunate to obtain any specimen of the flower or fruit, but Botanists describe it as belonging to the 17th class of Linnæus, and to the natural order Leguminosa.

The gum exudes spontaneously from the tree, and it does not appear usual, on any occasion, to make an incision for that purpose. Two kinds were shown to me, of which that which is of a dark crimson color, called "Moselle," is esteemed the best; its price at Muscat is from 6 to 8 rupees the seile. Dragon's-blood is called by the Arabs *Dum Khoheil*, and *Edah* by the Socotrians. I was frequentlyassured, that not more than a tenth of the quantity which might be procured, was ever collected by the Bedouins; but this, as with the aloes, appears to be owing to there being no regular demand.

From a tree, called in the language of the island, *Amara*, they procure a light-colored gum, which is slightly odoriferous, but is much inferior to that called Oliban, obtained on the Arabian coast. Sketches and descriptions were taken of the other varieties of trees on the island, but as they do not appear available for building, or any useful purpose, and are merely remarkable for being indigenous to the island, I have not considered it necessary to swell this paper with any remarks on them. A large collection of plants was also made, and the Botanist on the granite peaks would yet meet with a rich harvest. On the summit of these mountains the Bedouins collect a grey-colored moss, called *Shennah*, which is used by the Arab females to dye their faces of a yellow color. It adheres firmly to the granite spires, the whole surface of which is covered with it; they thus receive a coloring which is not their own, but which is not however far removed from it. As agriculture is almost wholly unknown on the island of Socotra, the only

grain which is cultivated on any part of the island is called *dekhan;* this is preferred to any other, because it requires less attendance, and if watered, will produce a crop at any season: provided there is water in its vicinity, they do not appear to be at all solicitous as to the quality of the soil, or the spots they select to serve as fields. They merely remove the loose stones, and with them build up a well, to prevent the inroads of the cattle; the soil is then somewhat loosened with a pointed stick, (for they have no articles of husbandry,) and after being divided by low narrow embankments into small squares, the seed is thrown on them much in the same way as it is in England. In the absence of rain these squares are filled with water twice a day, until the grain has nearly attained its full growth, when once is considered sufficient. It is now tied in the upper part into portions about the size of sheaves, in which state it is allowed to remain until it is ripened and is cut down. When milk is abundant, and they can obtain dates, dekhan is rarely partaken of; but when the supply of these is but scanty, it forms the chief article of their food. It adds not a little to the value which they place on this grain, that they are enabled to keep it uninjured for a long period. No dekhan is grown on the west end of the island; but on the east the enclosures in some of the valleys are very numerous. It is however to their date groves, next to their flocks, that the inhabitants look for their principal means of support. With the exception of a small one at Colesseah, and another on the west side of the granite peaks, these are also confined to the eastern portion of the island. Here the borders of the numerous streams which intersect it are lined for miles with them: the foliage is somewhat more scanty than that of those of Arabia, but I observe no other peculiarity in the tree. Some are fecundated at the latter end of December, and others as late as the early part of March; they must therefore secure to themselves a supply of fresh dates for two months. Those which are cultivated amongst the granite peaks produce the first crop. There are however some groves on the sandy belt at the southern side of this island, which I have been repeatedly assured bear two crops during the year; the one in May, after the N. E., and another in October, after the S. W. monsoon; the fruit is not held in much estimation. From the other groves, though a large quantity is collected, yet it is not sufficient for the consumption of the inhabitants, and a considerable supply is annually drawn from Muscat.

In all the other valleys which may have contained water, or through which water may have passed, there are an astonishing number of Nibet trees (*Lotus nebea*, well known in Egypt and Syria); the fruit is about the size of a cherry, of rather a pleasant flavour, and is produced at all seasons. The Bedouins collect it, and after bruising the berry between two stones until it forms a paste, they mix with it a little ghee, and devour the whole with much relish. Their camels are exceedingly fond of the young branches of this tree, and from its bark the Bedouins extract a tan for their hides. The tamarind occurs frequently among the hills; as well as the wild fig; from the fruit of the former the natives decoct a cooling and refreshing

drink, and the umbrageous foliage of the latter affords to the Bedouins a most grateful shade during the heat of the day. The Bedouins also eat the inner bark of a tree so called, which is found growing near the sea shore. In the vicinity of Tamarida, some melons, beans, and a little tobacco, sufficient for the consumption of the inhabitants, are cultivated; on the granite hills some few orange trees, a species of wild grape, and a kind of wild pear (?) are also found, but no other fruits or vegetables of any description is produced or known. I have already noticed the fertility of the soil in some parts of the island, and the extraordinary advantages it possesses in its numerous streams: both are utterly disregarded by the natives. The whole of the land in the vicinity of the granite peaks is in the highest degree susceptible of cultivation. Grain, fruits, or vegetables to any extent might be reared in the plain near Tamarida, and amongt the rich valleys in the direction of Ras Mamse. The face of the hills on the northern side might be terraced and cultivated in the same manner, as is customary in Yemen and Palestine. In a word, was it not for the prevailing ignorance and sloth which exists among its inhabitants, Socotra in a few seasons might be rendered as celebrated for the extent and variety of its productions as it is now remarkable for its total want of them.

Natural History.

The only animals we saw in Socotra were camels, asses, oxen, sheep, goats, and civet cats. The camels were as large as those of Syria, and were more remarkable for strength than for speed. As they are continually ascending and descending the mountains by bad passes, they become nearly as sure-footed as mules; but being constantly fed on succulent herbs, they do not, if this food is taken from them, display the same endurance of thirst as those of Arabia; when confined to the parched shrubs which grow on the low land, they require to be watered daily. Camels are principally used either by the traders while seeking ghee among the mountains; or by the inhabitants, for the purpose of bringing dates or fire-wood from the interior; the whole number on the Island does not exceed two hundred. For those I took with me I paid six dollars the month; the price for which they are sold is usually from 20 to 30 dollars. Cows are very numerous in the vicinity of Tamarida, on the granite range of mountains, and in many of the eastern parts of the island. They are usually of the same color as that which distinguishes the Alderney breed in England, though their size does not far exceed the Welch breed. The hump which marks those of India and Arabia is not observed here. They find an abundance of pasture, are sleek and fat, and their flesh of a most superior quality. The natives prize them for the sake of their milk, with which they make the ghee, that is in so much estimation on the coasts of Arabia and Africa. They are not therefore solicitous to part with them, and the price they demand compared with that for which they are purchased on the Arabian coast, is proportionally high; 10 dollars was the sum we paid for those we procured. Their flesh was pronounced equal to our finest English oxen. Should Socotra, as is contemplated, become a station for our steamers, an agent would be enabled with little

trouble to supply as many of these as might be required. The number on the island at present exeeds 1600.

Vast flocks of sheep and goats are found in every part of the island, the latter are indeed so numerous, that the owners never trouble themselves with counting them; the sheep have not the enormous tail which disfigures those of Arabia and Egypt; they are usually small, and lean, with remarkably slender legs, and their flesh is not well tasted. The Bedouins wash them every two or three months, to prevent them from getting the rot; their wool is manufactured into the thick cloaks which are so well known in Arabia and Persia. There are several varieties of goat on the island, and a milch-goat, of which nearly equal care is taken with the sheep: another kind, of a reddish color, with long shaggy hair, which is permitted to rove about the island, and which appears common property; a third is the wild goat, which is only found in the loneliest glens, or on the summit of the loftiest hills; their flesh is much prized by the Bedouins. When the shepherds are desirous of catching them, they seek about for their haunts until they discover the track by which they pass up and down the mountains; across this they spread a net. One of their number then ascends to the summit of the mountain by another route, and makes his appearance before the animal, who no sooner discovers him than he darts down the path and becomes entangled in the net, where he is quickly secured by those who are stationed there for that purpose. Amidst the hills over Tamarida and on the plain contiguous to it, there are a great number of asses which were described to me as differing in some respects from the domestic ass, but after repeated opportunities of observing them I find there is no reason in such a distinction. It is more than probable that the introduction of camels superseded the necessity of employing them as beasts of burden, and they were therefore permitted by their masters to stray where they pleased. They now wander about in troops of ten and a dozen, and evince little fear until they are approached too close, when they dart off with much speed. Although they were not applied by the natives to any useful purpose they would no doubt be found, should occasion hereafter require it, of much utility. The only wild animal that is known among the hills is the civet cat, of which it is needless to give any description. This animal is very abundant and was frequently brought to me for sale, but I have not been able to learn that the natives take any trouble to collect much of its perfume. Hyenas, jackals, monkeys, and other animals which are common to the hills on the shores of either continent, are unknown here; we do not even find the antelope, which is the more singular as it abounds on most of the other islands of the Arabian coast. The dog is also unknown, and one we had on board was frequently mistaken for a swine. I saw but one snake during the whole of the time I was on the island, and the head of that was too much bruised for me to ascertain if it was poisonous, though the natives assured me it was so. From them I also learnt, that after the rains a great many made their appearance, and some marvellous stories were told me respecting their size and fierceness; how true these may be, I

know not, but on the low land they have an astonishing number of scorpions. centipedes, and a large and venomous description of spiders, called (?) the bite of which creates alarming inflammation, and even with young children, it is said, sometimes proves fatal. In some places it was a chance if a stone was removed but that you would find one or more of these insects. Locusts have rarely been seen in Socotra, and those which were, are said to have been few, and were most probably stragglers. Ants are numerous, and the bite of one kind is scarcely less painful than the sting of a wasp; near the dekhan enclosures, field mice are often observed, and on the hills they are much troubled with rats and other vermin. The chameleon is a native of this island. The only birds I saw were cranes, flamingoes, wild ducks, a species of water-fowl, wood pigeons (very numerous); the swallow, the lapwing, owls, bats, and four varieties of the vulture: the last are particularly serviceable in cleansing the earth of carcasses and filth. There is also a small bird, with a red beak and dark purple plumage, called in the Socotrian language *Mubeared*, which utters a shrill and loud cry, not unlike that which might be produced by an effort of the human voice. Cassowaries are said to have been seen on the island, but I neither saw nor could learn any thing of them.

Government.

It has already been noticed, that the government of the Island of Socotra, from a very early period, was dependent on the kings of the incense country, and the early Portuguese navigators found them, on their first arrival, still in the undisturbed possession of their ancient patrimony; but after ALBUQUERQUE had conquered and overrun the island, he vested its government in the hands of some of his officers, who, with a remnant of his troops, was left behind to retain it. The Portuguese appear to have held possession until the decline of their power in India, when they intermarried with its inhabitants, gradually lost their ascendancy, and Socotra, after this short interruption, again resumed its solitary dependence, under its ancient masters. From this period, there is reason to believe, that a brother or some near relation of the Sultan of Kisbeen, on the Arabian Coast, resided permanently on the island as its governor, until within the last century, when it has been merely subjected to an annual visit from Kisbeen. The revenue is then collected, and any complaints which require the interference of the Sultan, are brought before him. When these objects are accomplished, he again takes his departure. During our stay at Kisbeen and on the island, we made numerous inquiries to ascertain who at present exercised this power, but this it proved no easy matter to discover. The old Sultan is blind, and incapable of managing the affairs of his government, and all has gone to confusion. Various claimants appeared, but ABDULLAH was pointed out as the influential individual; from him therefore we procured letters specifying the nature of our visit, and requiring from the islanders every assistance which we might stand in need of. Little attention was however paid to this letter, and during our stay another chief, HAMED BIN TARY arrived, and under the threat of burning the town,

he succeeded at Colesseah in procuring about fifty dollars worth of ghee, with which, after sending on directions to Tamarida, forbidding our being furnished with either camels or guides, he again sailed for Kisbeen, and openly boasted of what he had done. During the present year, no other member of the family is expected on the island, and as the sum collected annually, at other seasons, rarely exceeds in value 200 dollars, the authority of the Sultan may be considered as more nominal than real.

ABDULLAH in his visits has been known to inflict chastisement with his own hand on the Bedouins, who have neglected to bring him the full quantity of ghee, to which he has considered himself entitled, and even to imprison them for a few days; but I could not learn that he possessed sufficient power to inflict punishment of any kind on the Arabs, the greater number of whom are indeed exempted from contributing to any part of his revenue. It is from those who collect the ghee at Tamarida, Colesseah and Codhaop that he procures the greater part of the only article which he now draws from the island. The attention of ABDULLAH during his visits appears solely directed towards this object, and though complaints from former usage are occasionally brought before him, yet the instances are rare, and his decisions are not much cared for.

At Tamarida, an old Arab, who was formerly a sipáhí in India in the service of Báji Ráo, by virtue of his age, and long residence in the town, possesses some influence. Another at Colesseah named SALEM, is also qualified by the townsmen with the title of Shekh, in order mainly it would appear that he might secure presents from the vessels visiting the port, but nothing is more certain than that they do not possess throughout the island a constituted authority, either civil or military, or of any description whatsoever. Notwithstanding the singular anomaly of so great a number of people residing together without any chiefs or law, offences against the good order of society appear infinitely less frequent than amidst more civilized nations; theft, murder, and other heinous crimes are almost unknown. No stronger instance can be given of the absence of the former than the fact of my wandering for two months on the island, without having during that period missed the most trifling article. Some intelligent Arabs, who had resided there some fifteen years, assured me that the only disturbances known were occasional quarrels among the Bedouins, respecting their pasture grounds, and these were as usual settled either by the individuals fighting the matter out with sticks, or by the interference of their friends. It is no doubt this security of person and property, which has brought from the shores of the continent on either side so many settlers to the island.

Inhabitants.

The inhabitants of this island may be divided into two distinct classes, those who inhabit the mountains and high lands on the western extremity of the island, and which there is every reason to believe are its aborigines, and those who reside in Tamarida, Colesseah, and Codhaop, as well as several tribes who occupy the eastern portion of the island: the latter are a

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mongrel race, the descendants of Arabs, African slaves, Portuguese, and several other nations. Of the former I shall now give as full a description as the limits to which I have considered it necessary to confine this paper will admit. It is however necessary for me to premise, that though from personal observations I have been enabled to elicit every necessary degree of information connected with the present physical habits and domestic manners of this isolated race, yet there were some interesting points connected with their former condition, religion, and usages on which I was anxious to obtain some knowledge. This however from the jealous and suspicious character of those with whom I was obliged to converse, I found to be almost impracticable; they either declined answering the questions altogether, or they only furnished replies which were calculated to mislead. Some of this reserve melted away before we left, but my inquiries did not tend to elucidate facts of any importance. In the subsequent sketch I shall however have occasion again to touch on this subject.

On the Bedouins. The Arabs who visit Socotra, in consequence of their pastoral habits and wandering mode of life, have bestowed on this class the appellation of Bedouin, to which race, though they widely differ in some points, there is yet in others a striking resemblance. The principles of their political constitution are like theirs exceedingly simple: all are divided into families or tribes, each occupying a determined domain on the island, and each having a representative head, who formerly exercised what might be termed a patriarchal authority over them. In general, the office is hereditary, though it is sometimes filled by persons who have been selected for the superiority of their abilities. It was to this individual that the Sultán formerly, when he resided on the island, looked for the collection of his tribute, and to the Sultán he was also in some measure answerable for the good order of the six tribes; but at present his authority appears to be merely that of an influential individual, before whom complaints are taken for arbitration, but who possesses no power to punish a delinquent: an individual may also carry his complaint before the Sultán, or his deputy, or he may, which is the usual practice, retaliate on the injurer or any member of his family; but these affairs are not carried to the sanguinary lengths they are in Arabia, where the murder of one individual is revenged upon the person of his assassins or their relations. I made numerous inquiries, but I could not ascertain that any of their quarrels terminated in bloodshed: certainly this may be owing in some measure to their having neither fire-arms nor weapons of any other description than sticks and stones; but these peaceable habits are forcibly illustrated by the fact of so many tribes occupying territories so intermingled with each other, where the variable nature of the pasturage, and the scarcity of water, compel them from different quarters to meet on the same spot, without reference to the actual owners; and yet that skirmishing among them should be of such rare occurrence.

Physical Character, Persons, Diet, &c. &c.

The men are usually tall: their limbs appear strong and muscular, and remarkably well formed; the facial angle is as straight as that of Europeans;

the nose is slightly aquiline; the eyes lively and expressive; the teeth good, and the mouth well formed: their hair is worn long, and curls naturally, but without the slightest approach to the woolly texture or appearance of that of the Negro; they wear generally a beard and whiskers, but no mustachios: their complexion varies a good deal; some are as fair as the inhabitants of Surat, while others are as dark as the Hindus on the banks of the Ganges. They walk with an erect gait over the worst ground, and will bound over the hills like antelopes. From constantly climbing the rocks and mountains, they have contracted a habit of turning in their toes, which gives them over the plains a slight degree of awkwardness in their walk; notwithstanding this slight defect, the regularity of their features, the fairness of their complexion (for those which are very dark comprehend but a small portion of their number), and the models of symmetry, which are occasionally presented to the eye, render them a remarkable looking race, far distinct and removed from any of those varieties of the human race which I have seen on the shores of the continent on either side.

Their dress consists of a piece of cloth wrapped round their waist, and the end thrown over the shoulder. No ornaments are worn: in their girdle is placed a knife; but as they have no weapons, they carry in their hands a large stick. In their various modes of dressing their hair they display a little foppery: some frizzle it out like the Arabs on the coast of Egypt; others allow it to curl naturally; while the generality permit it to grow to a considerable length, and plait it into tresses, which are confined to the head by a long braided cord, made from their own hair. Their skins are clear and shining, and remarkably free from eruptions or cutaneous disorders. Many are however scarred from the application of hot irons for the removal of local complaints—a mode of cure they are quite as fond of practising as their neighbours the Arabs of the peninsula.

Of the Females. The same remarks which I have given to the person and features of the men may be applied with little alteration to those of the females: there is the same symmetry of form, the same regularity of features, and the same liveliness of expression; but their complexion does not vary in an equal degree: few are darker than the fairest of the men, and some, especially when young, were remarkably pretty: the legs of some of those advanced in age were of an astonishing thickness; but this defect is more observable among those who reside near the low-lands, and it but seldom occurs among the high-land females. Their dress consists of a coarse Cameline, secured round their waist by a leather girdle, and a kind of wrapper of coarse Dungree cloth, which is thrown over their shoulders: around their necks they wear a necklace made of red coral, colored glass, amber, &c. with sometimes a string of dollars. In each ear they wear three and sometimes four large ear-rings made of silver and about three inches in diameter; two of these are worn in the upper, and one in the lower, part of the ear. They go unveiled, and whenever we approached their houses, they conversed with us.

Of their habitations. In a moist climate like Socotra, it would be impossible for several months to live in tents; and as the variation of the seasons compels the Bedouins to shift with their flocks in search of pasturage, it may be considered as a bountiful provision that they are in the numerous natural caverns with which the limestone hills abound, provided with habitations ready fashioned to their hands. A Bedouin merely selects one of these, which from its size and situation is best calculated for his purpose; he then by means of loose stone walls portions off different apartments for himself and family, while the remainder is left to afford shelter to his flock. Singular spots are occasionally chosen for these places of abode: I have seen them on the face of a nearly vertical hill, at the height of 800 feet from the plain. In the valleys, and on the margin, they have another description of dwelling place: the rocks there whenever limestone occurs is equally cavernous with the hills: a cave is selected; they widen if necessary the entrance, so as to allow it to open into an enclosure; the upper part is then covered over with rafters, on which turf and some earth is placed, so that it becomes difficult at a short distance to distinguish it from the surrounding country: a wall constructed of loose stones encloses a circular space about 30 yards in diameter, which serves at night as a fold for their sheep and goats. I visited the interior of several of these: the only furniture they contained was a stone for grinding corn, some skins on which they sleep, other skins for holding water or milk, some earthen cooking pots, and a few Camelines hanging on lines taken across the roof. In one of these tied by the four corners and suspended from a peg by a string, you will frequently see a child sleeping. It also serves as a cradle, which they swing to and fro when they wish to compose it to sleep. In hot-weather, when the ground is parched with heat, these caverns are of a clammy coldness; the Bedouins are by no means particular in keeping them clean, and they usually swarm with fleas and other vermin. A few days after my first arrival, I had occasion to ascend a mountain on the southern side of the island, seeking for plants; and other pursuits had detained me until it was too late to descend. I therefore took up my quarters with a Bedouin's family in one of these caverns. It was formed by the overhanging of an enormous rock, which left a sheltered space of 50 yards in length and 10 in breadth. In the interior the surface of the limestone exhibited rounded masses, with cellular cavities in and between them; but I could not discover any stalactitic traces. These were the first Bedouins we had met with, and none of the party had seen Europeans before. Our coming unexpectedly on them, therefore, created with the females some little alarm; but a few words of explanation from our guide soon quieted them: a few needles to the females and some tobacco to the men set the whole party in good humour. Milk, dates, and whatever their cave afforded was readily placed before us, and they cheerfully assented to our request of passing the night there. At our suggestion, some grass was collected for us to sleep on, but this unfortunately proved an inducement for the goats and sheep, which were lodged in the same part of the cavern with several members of

the family to visit and run over us repeatedly during the night, so that we obtained but little rest.

The men pass their time in tending their flocks, in collecting dragon's blood, or aloes, and in occasional visits to the town, when the two latter with their ghí are exchanged for dates, *dhona*, the *jawarí* of India, and clothes. Accustomed to traverse these mountains from childhood, they perform on these occasions journeys of 30 or 40 miles, climbing almost perpendicular precipices, and crossing deep ravines, without occasionally experiencing any fatigue or inconvenience. The principal employment of the females abroad is also looking after their flocks; at home they make ghí, curd, and spin wool, which they afterwards weave into Camelines, and attend to their other duties. They have a curious method of cleansing the wool: they place it in a heap on the floor, over which they hold a bow, and snap the string against it, until the whole of the dust has flown off. Their method of weaving is also very simple, but a description of it here would occupy too much space. As it is very difficult to procure steel of any description on the island, the Bedouins have recourse to a method of obtaining combustion, which is practised by several savage nations. They procure two pieces of wood, the one hard Nebek (if procurable), and the other a short flat lath, from a date branch. The former is about 12 inches in length, and is inserted into a hollow, which is formed for that purpose in the latter.

The stick is then twirled briskly between the two palms, until the dust which is worn out by the friction, and which escapes down the side by a small grove cut near one side of the hollow, ignites. The dust is then placed on the top of a palm-branch, and a flame is soon produced. They have a method of obtaining a whiff of tobacco equally curious and simple. They slip off a branch of the Luhah tree of the required length and thickness for the tube, the extremity of this is then cut much in the same way as we do a quill before we split it: this part serves as a bowl, in which the tobacco is placed, while a small wooden plug, having a hole in its centre, at once prevents it from ascending the tube, and at the same time permits the smoke to be inhaled.

Food, &c. The Bedouins subsist principally on milk, and the grain and dates which they receive in exchange for their ghí. Whenever occasion calls for it, or a visitor arrives, they kill a goat or sheep; their mode of cooking is very simple: they separate the meat from the bones, cut it into small pieces, and boil the whole in an earthen pot; they use no dishes, and the meat is placed on a small mat, round which they seat themselves in eating. Contrary to the usual practice of the Musalmans, these islanders always cut their meat with knives, which are procured from the whalers and other vessels that touch at the island.

The moral character of the Bedouins stands high. The absence of any heinous crimes among them has already been noticed, and in general they may be considered as a lively generous race; but the most distinguishing trait of their character is their hospitality, which is practised alike by all, and is only limited by the means of the individual who is called on to

exercise it. Nor is this, as with the Socotrian Arabs, confined to those of their own faith; and while with the latter we were unceasingly tired with silly questions relating either to our religion or our views on the island, the Bedouins gave themselves no concern either about one or the other. A watch excited much mirth among them, and it was long before they would cease to believe it was a living animal; but unaccustomed as they were to the sight of fire-arms, what excited their utmost astonishment was a pair of pistols with detonating caps. Ever cheerful, they were always ready to enter into conversation, or to be pleased with what was shown them. I saw no instrument of music during my stay on the island, but they appear passionately found of song, and on one occasion, at a wedding, I observed them dancing. A party stood round in a circle, and while one of their number continued to sing, two or three others, without any pretence to a regular step, by a succession of jumps or bounds, endeavoured to keep something like time to it.

The Bedouins have a great variety in their modes of salutation: two friends meeting will kiss each other on the cheek or shoulder six or eight times, then shake hands, kiss them, and afterwards, exchange a dozen sentences of compliments; they have also the same singular and indelicate mode of salutation which is observed at Kisbeen, when they place their noses together, and accompany the action by drawing up their breath audibly through the nostrils at the same time. Male and female relations salute each other in public in this manner. Those of different sexes, who are merely known to each other, kiss each other's shoulder or hand, except with the principal individual of the tribe. When the females fall in with him, they salute his knees, and he returns it on their forehead. The old men salute children in the same manner. With the use of the compass the Bedouins were totally unacquainted, and they had no terms in the Socotrian language to express the cardinal points. The superiority of the Arabian numerals for extended calculations over their own, has induced them to entirely discontinue the use of the latter, and in all transactions among themselves, as well as with the Arabs, the Arabian alone are now used; it was therefore not without some difficulty that I was enabled to collect the Socotrian numerals, they are as follows:

1 Tand	5 Hamish	9 Scab
2 Terean	6 Heitah	10 Usharí
3 Thedder	7 Heibah	11 Usharít and
4 Urubah	8 Tomaní	12 Usharí terean

and so on to 20, which is two tens, or usharum, and usharín tand 21; thirty, which is thedder usharí, urubah or three-tens; forty, which is usharí, or four tens, and so on to one hundred, which is meyen or meian, which is like the Arabic mit or meat.

But by this decimal mode of calculation they could advance no further than ten hundred. I have frequently sought without success for something to express a thousand: this gives no very high opinion of their mental capacity, and it evinces, unless they have sadly retrograded, a strong proof

of their never having made any considerable advances in civilization. During my stay among these high islanders, I saw few cases of sickness; three or four sufferers from cancer, and as many from elephantiasis, were brought to me for medical assistance, and hard painful swelling of the abdomen, brought on by irregularity in their diet, was also frequent; but this was in no way surprising. A Bedonin will live on nothing but milk, and a little Dekhan, for several days, and then feast most exorbitantly on a sheep, the flesh of which is but half-boiled. Some bad sores were also shown me, occasioned by punctures from the thorns of the Nibek. But in general diseases are of very rare occurrence, and the Bedouins may be considered a hardy, healthy race. In the most solitary and lonely ravines and valleys I have occasionally met with idiots, who are permitted to stray about by themselves. Food is given them when they approach any habitation, but they usually subsist either on the wild herbs, which they gather on the mountains, or on the wild goats, which they knock over with stones near Ras Mamí. I saw one of these men going about perfectly naked. I came on him unexpectedly, but he fled with much celerity the instant he saw me.

Language. I am not sufficiently versed in oriental literature to ascertain what affinity the Socotrian language may bear either to the Arabic or any other language. I have therefore subjoined a copious vocabulary of words in general use among the Bedouins, by which I trust the scholar may be able to proceed in an inquiry that can scarcely fail to lead to most interesting results. I may notice in passing that the mountaineers from the Arabian coast are enabled to make themselves well understood by the highlanders of Socotra; but the Arabs from Muscat, or from any of the other towns, are quite unable to do so. The Socotrian language is spoken even among themselves by all those who have permanently settled on the island, and the Arabic is only used by the merchants while transacting business with the traders who arrive in buggalows.

At a period as late as when the Portuguese first visited Socotra, they found in it books inscribed in the Chaldean character. I had anticipated procuring some manuscripts or books which might have served to throw light on the history of the island; but in answer to repeated applications which I have made to different individuals for them, I have always been assured that some which they acknowledge to have possessed were left behind in their houses when they fled to the hills; and that the Wahabís, during their visit, destroyed or carried them off. The latter is the most probable, as these sectaries in their various eruptions are known to have manifested a strong desire to possess themselves of historical works*. The only vestige which I have been enabled to trace of any other character than the Arabic now in use, being adopted by the inhabitants of the islands, are some singular and interesting inscriptions, which I discovered on the sea shore about a mile in a direction from Ras Mamí.

They are inscribed in the horizontal face of a sheet of limestone rock, which is on a level with the plain, and is about 300 paces in circumference;

* Vide Burkhardt's Travels in Arabia, Vol. i. p. 393.

those parts which by their smoothness are best adapted for the purpose are covered with inscriptions and figures. I subjoin a sketch of a few of the most legible, which for the sake of greater accuracy I copied a second time. The resemblance in the character to some I copied near Wedgi in Arabia, which are supposed to be Ethiopic, is so striking, that I am tempted to believe they owe their origin to the same people. Should this on further examination prove the case, some interesting inquiries would suggest themselves. Independent of these inscriptions, there are immense number of rude representations of the feet of men, camels, sheep, oxen, asses, and cows; some of the human feet were as small as those of an infant, while others are treble their natural size; they are all placed in pairs, but with no general direction. The feet of the animals are cut so as to represent a soft rock, yielding to the weight of their impression. These occur sometimes in line, in others they are thickly crowded together, and amidst the latter is usually found the characters. The cross occurs very frequently, as well as a figure with a snake's head. I passed several hours in examining and sketching the most legible of the characters; but vast numbers are obliterated. I was at first tempted to ascribe these inscriptions to the work of the shepherds in their leisure hours; but they are so numerous, and must withal from the nature of the rock have been executed with so much labor, that I cannot on reflection refer them to that origin. The unity of design, exhibited in the constant recurrence of the same apparently unintelligible symbol, would rather induce us to suppose that a place of worship or pilgrimage must have formerly existed in its vicinity. At present there are half a dozen small ruinous buildings to the southward, and the remains of a wall running along to the northward, near it; but nothing more to verify such a supposition.

In a hill near Tamarida, I discovered several caves, which contain human skeletons. A wall eight feet in length had been built up parallel to, and at a distance of about seven feet from, the side, so as to allow a sufficient space for the bodies to be laid at full length; they appear to have been deposited in layers, though at different periods. Between and above each skeleton, there was a space of about two feet, which was filled up with earth until the whole mass reached the upper part of the cave. Among the mountains in the interior, I was assured, that these occur frequently, and there is reason to believe, the Bedouins deposited their dead in them, until a late period; but as they entertained great dread of my writing them down, as they termed it, they were never shown to me. I entered and discovered these by stealth. Upon conversing with the Bedouins, afterwards, on this subject, they admitted the fact of their serving as cemetries to their ancestors, but denied they had been used since the propagation of the Musalman religion. At present they observe the same mode of interment as the Arabs of Tamarida.

Of many other peculiar customs, a few only are now retained, of which the most singular is that they do not circumcise their male children until they are past the age of puberty, while with other Muhammedans, it is

performed at a very early age. On the eastern part of the islands, amidst the mountains, I was shown a rude stone chair, in which it was customary for the Bedouins to seat their youths (who were sometimes brought from a long distance) while the operation was performed. They have preserved the remembrance of a singular trial by ordeal, which was formerly practised on an individual supposed to have been guilty of any heinous crime; he was placed bound hands and feet on the summit of some eminence, and there compelled to remain for three days. If rain fell during that period on or near him, he was considered guilty, and punished by being stoned to death; but if the weather on the contrary continued serene, he was acquitted.

At first sight it may appear singular, that while, as will be shown by the subsequent section, the population of the eastern portion of the island should be found so mixed and varied, that of the western should have continued pure, and should still present the same general characteristics, but the causes on examination are almost self-evident. The Bedouins make no scruple to give their daughters to the native Arabs, and even to visitors who may pass but a short time on the island. The wives of the latter live with their husbands; while of the offspring by those of the former, the boys naturally follow the avocation of the father, and rarely if ever turn to the pastoral pursuits of their maternal progenitors: while the females are married not to the Bedouins (for though the Arabs have no objections to take a Bedouin wife, they would yet hold themselves disgraced were they to marry their daughters to one of that race), but to one of their own class. This accounts for the great disproportion which may be observed on the mountains between the males and the females. Independently of this, as one cause, want of water, which is felt on the western part of the island during the greater part of the year, and its general sterility, offer so little inducement to the native Arabs to reside there, that with the exception of some hamlets on the sea coast, in which they take up their quarters for the purpose of fishing, I did not in the course of my journeying in that part meet half a dozen families. But of those which are comprehended under the name of Bedouin, there are a few distinct tribes, of which it is necessary separate mention should be made.

Those most worthy of attention or remark are of a small tribe, of about 150 men, called Bahi Rahom, in the vicinity of Ras Mami. Their forefathers are said to have been Jews, and the features of their descendants still retain a strong resemblance to those of that race. The Sarí, the Sayffi, the Dermí, and the Zirghí descended from the Portuguese, under the general appellation of Cambar or Gambar, occupy the granite mountains; they are rich in flocks of sheep and oxen, and though the resemblance to the European cast of countenance may still be traced, and even in some instances they have preserved their original names, yet there are none of those symptoms of physical degradation which are observed in the race of the Portuguese at present in India. On the contrary, some of the finest figures and the most intelligent of the natives I saw on the island were of this class. Though readily recognized by the other tribes, their descent

appears in no way to have been urged as a reproach against them. It was told me that a few families amidst the mountains continued to speak their own language, but I was never sufficiently fortunate to fall in with any of them. Some of the hills on the north side of the island still retain the appellations which were bestowed on them by this nation.

As I have reserved the name of Bedouin, bestowed on the mountain tribes, without regard to the general application of the term, it will be as well to retain the name of Arab, with which the remainder with no higher claim have invested themselves.

Under this designation are included those who occupy Tamarida, the villages of Cadhúp and Caleseah, and the greater part of the eastern portion of the island; they may all be classed as foreigners, or the offspring of foreigners, who have settled here. The greater number are Arabs, who being left by boats passing between Zanzebar and the Arabian continent, to dispose of cargoes, take unto themselves a wife, and remain permanently.

The others are Indians, Sumaulies, Nubians, slaves, &c. who are attracted here from various motives; all are careful in preserving the recollection of their original country, and for this purpose they subjoin its name to their own. Thus our guide was called Suliman Muscaty, or Suliman from Muscat. Though so mixed a class, the Socotrian Arabs wear the same dress, and have adopted the same language and customs; their colour, features, and figure, as may be anticipated from their different origin, are so varied, that it is impossible to speak of them in any general terms. We have in fact every grade, from the flattened nose, the thick lips, and the woolly hair of the Negro, to the equally well-known characteristics of the Arab. Their dress consists of a loose single shirt, descending below the knee, which is confined to their waist by a leathern girdle, in which is placed all the arms they can muster. The lower classes wear nothing but a piece of striped linen round their waist, with another, when they are exposed to the sun, thrown over their shoulders; in rainy or cool weather, they all wear a thick woollen coat, sufficiently large to completely envelope them. The dress of the females consists simply of a long shirt of Indian cloth, over which is worn a loose wrapper, which after being taken round their person, the end is brought up over the neck, in order to serve them as a veil when they are desirous of concealing their faces.

The only employment in which the Socotrian Arabs engage themselves are either in tending their date groves, or flocks; in collecting ghí, or in the trade between Muscat and Zanzebar. Their date groves give them but little trouble; for directly the owner can scrape together a few dollars, he purchases a slave to attend them, and if his master's wealth increases, he adds to the number both of his trees and his slaves. Traders proceed among the mountains on camels, taking with them various articles which they exchange with the Bedouins for their ghí. The quantity collected is very great.

The Arabs who engage in the trade to Zanzebar and Muscat with this article receive in exchange for it grain and slaves. Contrary to the general prac-

tice of the East, the Socotrian Arabs treat their slaves with much harshness; they are hard worked, and indifferently clothed and fed. As these pursuits can only be engaged in during the fair or N. E. monsoon, it follows that a considerable portion of their time is passed without employment of any kind. To obviate the tedium of this period, I cannot learn that they have recourse to games of chance, or amusements of any description; the time appears spent in visiting each other, drinking coffee, smoking, and sleeping. In place of taking up their abode in caves, in the same way that the Bedouins do, the Arabs who reside outside the town live in huts, which are mostly of a circular form; the walls are constructed of loose stones, and are cemented with a mortar of which mud is the principal ingredient; they are rarely more than four feet in height, and they commonly enclose a space from 12 to 14 feet in diameter. On the top of these, and projecting nearly a foot over their sides, a conical roof, constructed of the branches of the date-tree, is sometimes raised, the apex of which at the point where the ends of the branches unite together, is chunamed, in order to prevent the rain from getting through. In others, though the walls are of the same height, they first place rafters across in a horizontal direction, cover them with date branches, and then cement them over with lime, mixed with earth, and sometimes with turf: the goats may frequently be observed grazing on the grass growing out of the latter. In several of these which I visited, in which it was impossible to stand upright, which were swarming with fleas, and which in size, it will be remembered, are scarcely larger than an English pig-stye, two or three families, each consisting of four or five individuals, were residing under the same roof. It is not therefore a matter of any surprise that fever sometimes sweeps off a whole hamlet. Were the materials of which these wretched and miserable buildings are raised scarce, and to be procured with difficulty, we might pardon or excuse the little attention to comfort, accommodation, or health which their construction exhibits; but when they are abundant, and when they have better models in the town before them, it furnishes a strong proof of their sloth and indolence, and warrants with many other proofs which may be adduced, that they have little inclination or capacity for improvement.

Notwithstanding Socotra's numerous inhabitants, Tamarida is the only collection of houses which may entitle it to the appellation of a town. Cadhup and Calesseah are but small villages, and the Arabs on the western portion occupy numerous small hamlets, consisting of from six to a dozen houses. Concerning the two villages of Cadhup and Calesseah, all that is necessary to be known of them will be found in Captain Haines' description of the exterior of the island.

Tamarida. I have been unable to ascertain at what period Tamarida was erected; but both from its name and the appearance of the houses, I am inclined to think it must have been anterior to the first visit of the Portuguese, and most probably founded by those who followed them. The natives date its existence from a much earlier period, but little reliance can be placed on their testimony. The nearest range of mountains in the

vicinity of Tamarida approaches the sea in the shape of an arch, on the chord of which, and nearly equidistant from the points where its extremities reach the beach, is situated the town. It consists at present of about 150 straggling houses, which are unconnected with each other, and are surrounded with date trees: of this number not a third is now inhabited, the others remain in the same ruinous state as they were left by the Wahabis in 1801. Though small, the houses are well constructed, of lime and coral, cemented over, and from this being kept white-washed, they have a neat appearance. They are usually two stories in height, of a square form, and with a tower in one corner, through which the stair-case is usually built; the windows face the N. E., and they are closed like those on the houses of Arabia, with wooden shutters, cut with a variety of ornaments, through the insterstices of which the air and light is admitted. The upper rooms are appropriated to the use of the harem; in the lower, seated on a platform, of which there are two, one on either side the door, with a passage between them, the Arabs receive their visitors, and transact all business. Attached to each house there is a small garden, in which is grown a sufficiency of beans and melons for the use of the inhabitants—enclosures of tobacco may also be seen among the houses. The number of inhabitants at the period of our visit did not exceed a hundred: several were absent at Zanzebar; but fifty added on that account to their number, gives the full number of those who at any period reside here. The Arabs flock down from the hills on the arrival of a ship, and may induce the visitor to estimate their number higher than I have done. There are but two shops in Tamarida, and the articles exposed for sale are grain, dates, and clothes; every individual, therefore, on the arrival of a boat supplies himself with whatever he requires.

In commercial transactions among themselves, money is rarely if ever used: certain quantities of ghi, &c. are substituted. Dollars are demanded from strangers who visit their port, and from my party rupees were taken when they were assured of their value; but there is no small coin of any description on the island.

The dollars are made into ear-rings for their women. Amber and ambergris, both of which are brought from Abdul Curia, were formerly substituted for money; but the practice for some reason has been discontinued. Amber is occasionally found along the southern shore of this island, but is not of frequent occurrence. The plain enclosed by the range of mountains already spoken of, which surrounds Tamarida, is watered by three mountain stream flowing fast close to the houses, which are with the others at no period of the year wholly dried up. A line of date groves on either side of each of these extends from the base of the hills to the sea shore, where they spread out into large groves. The ground through which these pass is composed of a few sloping hills, and rounded hillocks, intersected by plains and small ravines: these are destitute of trees or bushes, but the grass which is nourished there affords good pasturage to sheep and goats. The soil in some of the valleys and plains is of a reddish-coloured earth, and appears especially in the vicinity

of the date grove rich and fertile; in others, it is of a light colour, is filled with small stones, and looks of a poorer quality. With the exception of the palm trees, a few melons, some tobacco, and a few enclosures of dekhan, no part of this plain is cultivated; and the traveller who may hereafter visit Socotra in the period between February and June, may from this circumstance and its then parched and almost sandy appearance form a different opinion to mine respecting its fertility. But the least promising parts of this plain, when cultivated for a single season, essentially alter their character for the better, and others, on our first arrival in January, wore a most luxuriant vegetation. I therefore repeat of the part particularly, what I have only mentioned generally before, that not only might grain or vegetables be cultivated here to a large extent, but that the nature of the climate and the soil would also nourish the greater number of our tropical fruits.

Of the Inhabitants in general.

Notwithstanding the healthiness of the Bedouins, the Arabs appear a weak and sickly race, and dangerous fevers are said to prevail among them. After the rains the graves in the town of Tamarida are frightfully numerous; and it may be truly said of Tamarida, that it contains treble the number of houses that it does inhabitants, and of tombs more than ten times the number of both included. In other parts of the island, where the vestige of former habitations could be traced, there also might be seen the same proportion of graves. The Arabs formerly paid great attention to the state of their tombs: of three stones, one was placed at the head, another at the foot, and a third in the centre. On the former of these was inscribed the name, age, &c. of the deceased; but the Johasmus, during their visit, from their known aversion to any kind of decoration over the remains of the dead, broke and destroyed the whole of these, which came under their notice during their stay.

My attention is particularly directed towards obtaining information respecting their form of religion. At present every individual on the island is, or professes himself to be, a Mussalman. The Bedouins, as in Arabia, hold the doctrines but loosely: many neglect the fast of the Ramzán, few are acquainted with their morning and evening prayers, and these few rarely trouble themselves with repeating them. Circumcision, I have already noticed, is not practised until a late period, and in some families, I have reason to believe, it is omitted altogether.

The Socotrian Arabs, on the contrary, are zealous professors of the Mussalman faith; although, at the same time, they are utterly ignorant of its most essential doctrines, and like all those nations who possess but a slight knowledge of its tenets, they are bigotted and intolerant to an insufferable degree. During my stay at Socotra, individuals of the party occasionally fell sick, and the horror which they expressed on these occasions at the idea of its becoming necessary to bury a Christian on the island, convinced me that if it was ever done, they would perform their threat of disinterring the corpse with every indignity, and throwing it into the sea. The Mahara Arabs, from the Coast of Arabia, a noble race of Bedouins, who occa-

sionally reside for a few months on the island, ridicule them unmercifully for this spirit of intolerance, and have assured us, even in the presence of the zealots, that the Socotrian Arabs were poor wretches, who had nothing to plead in defence of it save the lowest state of ignorance, and their mongrel descent. After the receipt of HAMED BIN TARY's letter, prohibiting our further progress through the interior of the island, I was confined by the Socotrian Arabs for several days in the town, and it was principally through the influence which the Mahara Bedouins exercised on that occasion that I was again enabled to set forward on my journey. The behaviour of the former on this occasion exhibited a mixture of irresolution, timidity, and avarice which I have never seen equalled; they wavered between dread of the Shekh if they permitted us to go, and their fear of missing what they might gain by hiring out their camels if they prevented us. Exorbitant demands were at first made; and when they found that I would not listen to these, they continued to hold councils for three days, during which period, whenever I had commenced and packed up all in readiness for starting, permission was given and cancelled more than half a dozen times.

It is observed by MALTE' BRUN in his "Universal Geography," that the population of this island might furnish a subject of lengthened discussion. He notices on the authority of PHILOSTORGES, EDRISSE, and UMDAULAH, that a colony, sent here by ALEXANDER THE GREAT, remained for a long period; and during the time of PHILOSTORGES, an ecclesiastical historian, who wrote a history of the church on the Arian principles at the conclusion of the fourth century, that they spoke the Syriac language. Various other authorities are cited by the same author, to prove the existence of a race of Christians with which the island was peopled until as late a period as 1593, when the Nestorians and Jacobites had each a bishop residing on it; and even when Sir THOMAS ROE visited it in 1614, he observes, that "the Bedoignes," as he styles them, "were of the Nestorian persuasion." In the absence of books or manuscript of any description, for I believe no notice connected with the habits or religious character of the islanders has since this period been handed to Europeans, it might prove a hazardous task to venture, on the mere traditions of the islanders, any observation on the causes or events which have led to the total abolition of the Christian, and the universal establishment of the Mohammedan, creed. Information on these points may possibly be gleaned from authors to which I have not at present any means of gaining access; but I cannot, however, dismiss the subject without observing, that as the channel of the Indian trade, at the early period to which the above-mentioned authors refer, was by the way of Socotra, and the ports at the entrance of the Red Sea, it can excite but a small portion of surprise to find proselytes of these persuasions residing on a spot so far removed from where the principles on which these were founded were avowed and practised. It is observed by SALE, in his preliminary discourse, that the persecutions and disorders which happened "in the eastern church, soon after the beginning of the third century, obliged great numbers of Christians

to seek for shelter in that country (Arabia) of liberty, who being of most part of the Jacobite community, that sect generally prevailed among the Arabs;" and, although it does not appear that the southern parts of the peninsula were subjected to the ecclesiastical rule of either the Nestorian or Jacobite bishops, yet from the causes I have before mentioned, it is not likely they would have overlooked a spot like Socotra, where there is every reason to believe they could have indulged unmolested in the open profession of their faith. With respect to the disappearance of these primitive Christians, as well as those which were left on the island by the Portuguese, the causes appear almost self-evident. It would produce an anomaly in human nature, almost as striking as that which is afforded by the history of the Jews, if surrounded as they were by natives universally professing the Mussalman religion, receiving no fresh influx from those of their own persuasion, and left an isolated and neglected race, if they alone had refrained from embracing the new doctrines; and although occasional skirmishing, consequent to a difference of opinion, may have occurred between the different sects, yet that this was accomplished by a gradual and silent change, and not by any violent or exterminating measures, appears equally evident by the simple fact of their descendants existing as a distinct race to the present day. Evidence to the fact of numerous colonies of different countries or persuasions formerly existing on the island may be found in the present arrangement and distribution of its inhabitants into distinct tribes, many of which are still recognized as of foreign origin.

Time has not produced a greater change in the government or condition of this island than it has in its ecclesiastical masters. In place of an archbishop and two bishops, we have now but a single priest, who combines in his own person the various offices of Mullah, Muezzen, and school-master. A single Cádi solemnizes the whole of the marriages which take place throughout the island, and I have on more than one occasion met Bedouins seeking him for a license, when he has been absent among the hills cultivating his date groves.

Two small and insignificant mosques at Tamarida, the one called Mir Advance, and the other Abder Rahan, and one yet smaller at Calesseah, are now the only places of worship for the reception of the faithful.

It would form a curious subject of enquiry to ascertain what form of religion the establishment of the Christian faith displaced. A ruinous building was shown me on the spot, marked out in the map, which was said to have been an ancient place of worship; but it was in too dilapidated a state to enable me to ascertain the truth of the tradition, nor have I been able to discover others that would serve to throw any light on the subject.

The population of this island, as stated by some travellers at a thousand souls, is evidently much under-rated, but from their wandering mode of life, and other causes, it became difficult from any section of the island to form a correct inference of the population of the whole. The method I adopted was, at the conclusion of each day, to note the number of individuals I had seen, and these I find amount to upwards of two thousand, though I am

confident it does not comprehend more than half their number, for in several places they concealed themselves whenever we approached, and though, as will be seen by the map, my rambles led me to many parts of the island, yet there were necessarily many hills and remote valleys I could not inspect. I am further strengthened in this belief by summing up the number of the tribes, and I therefore fix the amount of the population at 4,000. Two intelligent Arabs, who have resided on the island upwards of 10 years, and have journeyed to many parts of it, tell me they consider this far below the actual number; but with Arabs an allowance should always be made for numerical exaggeration.

Comparing this calculation with the whole surface of the island, which amounts to about a thousand square miles, it gives four individuals to each, which when we reflect on the great proportion of bare rock, which the surface of the island exhibits, appears very considerable.

Although I have made diligent search and constant inquiries, I have been unable (with the exception of those which indicate the stay of the Portuguese) to discover any ancient vestiges or monuments that would prove this island to have been peopled by a race further advanced in civilization than the present, although I think there is reason to believe the population must have been more numerous, and that the island was consequently better cultivated. It is impossible to ascertain at what period their numbers were thinned; but that they have not been exempted from contagious fever, or some other desolating scourge, appears evident from the existence of such a multitude of graves in every part of the island, many of which appear to have been constructed at the same period; but that this period was somewhat remote, is equally evident, not only by the total disappearance of all traces of such improvement, on the face of the country, but by the present condition of the inhabitants. It must not be referred to the period immediately preceding the visit of the Wahabis, as has been suggested in some late discussions connected with the island; for those fierce sectaries confined their outrages, and the extent of their devastation, to Tamarida and its vicinity, and they did not attempt to pursue the inhabitants who fled from the town to the mountains at the first intimation of their approach.

[The length of the foregoing Report prevents our giving insertion to the equally interesting remarks of Capt. S. B. HAINES on the same Island. This Officer was charged with the examination of the coasts and the circumstances of the various harbours, which though more interesting to nautical men, and drawn up in a most complete form, would not perhaps interest the general reader so much as the view of the interior of the island. There are but 22 boats on the island, capable of carrying about 80 gallons of water in fine weather. They are sewn together with thongs of hide, or a kind of coir rope made from the young leaf of the date tree. Tamarida Bay on the north of the island is the principal port during the S. W. monsoon, but Ras Kourina lat. 12° 38′ 35″: long. 53° 55′ 50″, affords a better shelter, and is also serviceable in the opposite monsoon.

In the N. E. monsoon Gollonseer Bay is the best anchorage:—the town contains about 130 inhabitants, and 16 fishing boats. There are unfortunately no ports where vessels could ride in safety from all winds, and opposite sides of the island must be resorted to with the change of season.

We subjoin a vocabulary of the Socotrian language drawn up by Captain HAINES from a Town Arab—it is confessedly imperfect, and contains a large admixture of Arabic.—ED.]

A few words of the Socotrian Language.

Rheeon,	Tall, long.
Kurrhar,	Short.
Rheeho Rhain,	Salt water.
Rheeho Hali,	Sweet or fresh water.
Rheeho Lahrer,	Water to drink.
Ustal,	To eat.
Kahr,	A house.
Jeerhae,	Town.
Eshookko,	Sword.
Bundook,	A musket.
Rohsahse,	Musket-ball.
Hussin,	Iron.
Suffur,	Copper.
Teheal,	Wood.
Mushhein,	Day, fine.
Ahtay,	Night, fine.
Eerah,	The moon.
Kokut,	The stars.
Sheehein,	The sun.
Sahbedah,	Come here.
Setoah,	Go away.
Stahooa,	Sit down.
Saahd,	Make haste.
Ardein,	To sleep.
Kussah,	Scarce.
Huhr,	To-day.
Kuneree,	To-morrow.
Aig,	Male.
Ajah,	Female.
Mobiahee,	Boy or male infant.
Aunt,	Large timber.
Cutthaine,	Small timber.
Shaahr,	A month.
Anah,	A year.
Allef Ahew,	One thousand years.
Shoohut,	A fishing line.
Ucklaher,	A hook.
Bild,	Sounding lead.
Baroosir,	Anchor.
Sinselah,	A chain for anchor.
Duckhur,	A mast.
Tormahl,	A yard.
Seerar,	A sail.
Deerah,	A compass.
Famoose,	A lantern.
Bindeerah,	A flag.
Teelaher,	A hill or mountain.
Oubchaine,	A stone.
Seerhoc,	At a great distance.
Shalee,	At hand, close.
Thermoohen,	A tree, forest, &c.
Muckedeerah,	Jewarree.
Burrh,	Corn or wheat.
Degig,	Flower.
Aishahr,	Bread or cakes.
Toohlerdee,	Come here.
Tooshdsheioc,	Go away.
Tahdsab,	Go to market or bazar.
Hairah Tahr,	Go to-day.
Kuneiah Teedailiw,	Come to-morrow.
Deeah,	Good.
Deah,	Bad.
Tashw,	Well-dressed.
Sonah,	Correct, proper, straight.
Kurrhain,	Crooked.
Geih,	Plenty, numerous.
Haraheeme,	Few, scarce.
Yashar,	Dry.
Ferhain,	Daughter, or female child.
Adjoose,	Old woman.
Shebah,	Old man.
Ree,	The head.
Shiff,	The hair.
Teffcoose,	The eye-brows.
Taáhn,	The eyes.
Hadjhur,	The forehead.
Eidahen,	The ears.
Nahreer,	Nose.
Sheebah,	The lips.
Thetrinsh,	The teeth.
Lissen,	Tongue.
Nuhharhur,	The throat.
Konrie,	The shoulders.
Tahdah,	The back.
Meer,	The stomach.
Aiah,	The arm.
Asábak,	The fingers.
Dthuffer,	The nails.
Soab,	The feet.
Ahrur,	Rice.
Hammer,	Ghí.
Kutmehr,	Butter.
Sulet,	Oil.
Koof,	Milk, sweet.
Dthedadjee,	Fowls.
Baithde,	Eggs.
Urhain,	Goats or sheep.
Elhayten,	Cows or bullocks.
Kelb,	A dog.
Jerback,	Civet cat.
Gemeeher,	Camels.
Tahreeher,	Antelopes.
Teh,	Meat.
Sodah,	Fish.
Bussell,	Onions.
Serage,	A light of a candle, lamps, &c.
Scheat,	Fire.
Sebhem,	White.
Ophir,	Red.
Gee Reeho,	Plenty of water.
Rheeho harehen,	Scarcity of water.
Ebhem,	A well.
Kute,	Rope.
Sahrey,	A knife.
Kullum,	A pencil.
Donaiko,	An inkstand.
Koortass,	Paper.
Tokoothib,	To write.
Ketab,	A book.
Jild,	Skin or hide.
Kofeiah,	A cup.
Ahmateenahe,	A turban.
Thobe,	A shirt.
Ahrahder,	A sash or cummerbund.
Umekfaf,	Trowsers.
Sundook,	A box or chest.
Koorsir,	A chair.

Sahahm,	A plate or dish.
Merooah,	A fan or punkah.
Medfar,	A cannon.
Baroot,	Gun-powder.
Seloobah,	Stop, gently.
Tahfah,	To give.
Telloo,	Take hold.
Sherachah,	Go away.
Tuchahtah,	Come here.
Tahrise,	Kill.
Keen,	Plenty of any thing.
Toahde,	Make haste.
Addahfaarhar,	To be on good terms.
Kasuh,	To behave properly.
Semahto,	To converse.
Aher or Urr,	Take hold.
Alleh,	To ascend.
Tuckkafah,	To descend.
Estahel,	Sit down.
Tukaaee,	To read.
Tennaffer,	To mind.
Teneoash,	To spoil.
Trasher,	To spread any mat or bed.
Shahleen,	To strike a bargain.
Taongah,	To beat.
Enlajhah,	Do not strike.
Takassah,	To break.
Entuftuf,	Do not break.
Anelpad,	Make no agreement.
Entenduff,	Do not give.
Aahrah,	Remove or take away.
Arachenooch,	To take any thing away.
Aláteeaiha,	Do not take away.
Nichiahn,	To bring.
Sunkab,	Do not bring.
Deeah,	Good or well.
Deah,	Not good, bad.
Ustah,	To eat.
Unetook,	I have not eaten.
Toohtahr,	Come very close.
Teloosahr,	Go away to a distance.
Haihhe,	A man.
Dthamah,	Alive.
Sahmee,	Dead.
Shohoom,	The sun.
Meeloa,	A roof or top, awning, &c.
Shemtahr,	Dressed well or in good clothes.
Sheekah,	Close to.
Seerhoe,	At a distance off.
Enineshuch,	What have you got?
Aahumeh,	True or truth.
Toobat,	Untrue, a falsehood.
Fezaine,	Take hold.
Enlazaine,	Do not take hold.
Tuckahtab,	Do not sit down.
Tehtooah,	Do not stand.
Ishoop,	To sleep.
Tessobah,	To wash.
Tohtatrer,	To look.
An Tahteher,	Do not look.
Taber,	Broken.
Tekoodaiher,	Come near.
Tonde Sirhoe,	Go away.
Habra Rheeho,	Bring some water.
Rheeho Durnaham,	Salt water.
Ustugah,	To buy.
Kuthooan,	To sell.
Esshenal,	I will sell.

V.—*Note on an Inscription on the Mandara hill near Bhagelpur, (forming a postscript to Article* III. *of the present number.)*

On considering the form of the Sárnáth characters, it struck me that they resembled considerably those of an inscription engraven on the rocks above the *Talao* called Pouphar, on the Mandara hill, of which a reduced engraving is published in the second part of Colonel W. FRANKLIN'S Inquiry concerning the Site of Ancient Palibothra. The mountain is situated to the south of Bhágalpur: it is covered with mutilated images, fragments of stone and ruins; and although it now exhibits images belonging to the Brahminical mythology or passing as such in the present day, it may owe the abject condition of many of its temples to their having been Bauddha structures, destroyed during the well known persecution of this religion. Colonel FRANKLIN gives no conjecture as to the purport of the inscription, of which he merely says: "Descending from the summit to *Sankar-kund*, we proceeded to view some figures cut in the rock on the north-west of the hill: their appearance was singular."

I have introduced a drawing of this inscription, as fig. 3 of Plate IX. as from the size and good preservation of the original sculpture it furnishes some well-formed specimens of the written character of the period. A moment's inspection of this inscription shewed me my favorite land-marks, the title of a great sovereign, *mahárája adhi rája srí.* Most of the letters forming this expression agreed closely with the Allahabad forms:—the *srí* only differed materially, and corresponded rather to the type found on several of our ancient Hindu coins, especially the remarkable descendant of the Indo-Scythic series discovered in the cylinder at Manikyála (Plate XXI. fig. 9, of Vol. III. Journ. As. Soc.)

The restoration of the whole sentence, as far as I have been able to convert it into Devanágarí with the assistance of GOVINDA RA'MA, is as follows:

१ परम भट्टारक महाराजाधिराज श्री कुल्य भरन देव दया चय

"The mighty and venerable, the great king of kings, SRÍ KULYA-BHARANA DEVA, the mountain of mercy."

The letters of the name, however, are very doubtful:—the first seems more like an ऊ; the dental *n* न cannot follow the lingual *r* र, and the letters read as *deva* are uncertain. Neither is such a name known among the sovereigns of Magadha or Mithila. I only introduce the inscription into my plate to invite attention to it, as every authentic name of Hindu sovereigns is of importance to history.

VI.—*Extracts from a Journal kept during a Voyage from England to Calcutta, in* 1831. *By Lieut.* T. HUTTON, *37th N. I.*

On the 19th August in latitude 11°54′ north, longitude 25°24′ west. Thermometer at noon 88°; with hot, calm weather, the first albatross was seen. Flying-fish, albicores, porpoises, bonitos, whales and medusæ were seen in abundance daily.

On the 14th September, in latitude 25°5′ south, longitude 30°38′ west. Therm. 70½°; wind variable, we saw the first Cape pigeon.

This bird, called also the pintado bird, is known to ornithologists as the Cape petrel, (procellaria capensis.) They are about the size of, or perhaps rather larger than a teal (anas crecca), and look very beautiful when sitting on the water; but their flight, although strong, is rather heavy and ungraceful. They are prettily spotted over with black and white, on the back, rump, and wings; head and neck black; under parts pure white, legs and feet black; beak shining black. Length 15½ inches, breadth with wings expanded 2-6 feet.

They are remarkably fat and plump, thickly clothed with feathers, under which is a close beautifully soft down of a dark greyish-brown colour.

The Cape petrels appear to be stupid unwary birds, easily caught by throwing a line out astern, and allowing them to entangle their wings in crossing and recrossing the wake of the ship; or, perhaps this may be attributed less to stupidity than to their great greediness, making them more intent on securing any morsel thrown overboard, than on avoiding the snares which are laid for them.

They are also taken with small hooks, and even crooked pins, baited with a little piece of fat, which they greedily swallow, fighting and screaming over the savoury morsel, until a sudden jerk of the line, hooks some unfortunate gourmand, and proves even to the poor petrel the truth of the saying, "there is death in the pot!"

When brought on board they both bite and scratch very sharply, and often successfully defend themselves by squirting over the assailant an oily liquid of a deep orange colour, smelling so rank and offensive, as to render the clothes so bespattered scarcely bearable for many days afterwards, and it is indeed very difficult to get rid of it from the hands even after repeated ablutions. Along with this nauseous fluid, many of them restored the pieces of pork with which we had so treacherously supplied them.

The natural food of these birds consists most probably of molluscous animals and medusæ, particularly those which shine with a phosphoric light in the night time, and which light, *if* the petrels are nocturnal birds, as Professor RENNIE says they are*, may be the means of guiding them to their prey; I am, however, rather inclined to doubt their being nocturnal, for reasons which will presently appear.

In examining the substance disgorged by some of these birds, I found a number of the interior cartilaginous membranes of the "vilella scaphidia," qauntities of which had been seen a few days before, of a beautiful blue colour, floating on the surface of the glassy sea.

Their numbers varied considerably on different days, sometimes following us in large flocks, and coming close to the ship's stern, while at other times there were only two or three to be seen.

I was much astonished at the coolness with which they would sit on the swelling waves and even allow the spray to dash right over them without rising, and seemingly with perfect indifference, continuing their squabbles for the baited hook, and diving very prettily should the object sink before they could pick it up. They alight upon

* "Architecture of Birds," p. 30.

almost every thing that leaves the ship, and this generally attracts the attention of the albatrosses, which keep at a greater distance.

I am much puzzled to account for the total disappearance of these birds during the night, and not only of these, but the albatrosses, stormy petrels and blue petrels also, for although they had continued about us in numbers all day, yet no sooner did the sun touch the horizon, than all disappeared as if by magic.

The question is, where do they go?

Petrels are *said* to be *nocturnal*; but such cannot be the case with the Cape petrel, stormy petrel, or blue petrel, for we had them sporting in our wake the whole day, and at night they disappeared, to rest I should suppose.

But *where* do they rest?

If on the waves, is it not strange that we never found them sleeping in the calm, clear moonlight nights, as we held steadily on our course? Yet never did we see one after sunset.

To suppose that they could wing their way to some of the rocky islands scattered through those southern latitudes would be absurd, for often we had flocks of these birds around us, when the nearest land must have been from 15 to 20 degrees distant, and although their powers of flight must be great indeed to enable them to keep on the wing with little intermission during the whole day, even when "blowing great guns," yet, as they did not leave us until sunset, with what fearful rapidity they would require to fly, when 10 or 1200 miles at sea, in order to reach their resting-places before the shades of night should overtake them!

Pigeons have been proved to fly at the rate of 60 miles an hour, but the petrels would require to perform a flight of 3 or 400 miles in the same time!!

That they are *not nocturnal* is clearly proved by their continuing with the vessel *all day*, and as it is evident they cannot exist without repose, we may fairly conclude that they *rest* at *night*, and again this rest must be taken on *land* or *water*.

That they cannot rest on land, is plain, from what I have already stated. There remains then nothing but the water for them, and we may conclude I think with safety that the reason of our not seeing them at night, is because they are able to descry the tall white-robed masts of the vessel at a sufficient distance to enable them to make a clean retreat before we came upon the spot which they had occupied, and this is the more probable, as they would, like other water-fowl when sleeping in any number, have a watchful sentinel to warn them of the approach of dangers to which they must be constantly ex-

posed from the monsters of the deep. I have repeatedly inquired of seafaring men, whether they had seen these birds at night, but none could recollect a single instance. One person mentioned having caught a stormy petrel on a small hook, which had been towing astern all night, and therefore he concluded that the bird was nocturnal. But this is no proof at all, since he did not know the hour when the bait was taken, and it is therefore more than probable that it occurred at early dawn, when these little skimmers of the sea were as usual on the wing in their restless search for food.

Quere—As the albatrosses and petrels must be many days at sea, without being near land, whence do they find water to drink, unless it be that of the briny ocean ? or, will their food, supposing it to consist of mollusca and medusæ, supply them with sufficient moisture ?

On the 28th October, these birds deserted us, and we saw them no more during the voyage, having followed us from the 14th September in latitude south 25°5′ and longitude west 30°38′ down to latitude south 41°38′, and longitude east 33°8′, and up again to latitude south 31°54′ and longitude east 80°8′. A period of one month and 14 days.

Although we saw the albatross on the 19th August, we were not fortunate enough to procure one until the 26th September, in latitude 33°38′ south, longitude 3°5′ west ; thermometer 54°, weather cold.

This bird was shot by a passenger, and although in all respects agreeing with the generic description, and a true albatross, was by the officers of the ship termed a " mollimawk."

The plumage beneath is pure white, as also the rump, head and nape ; through the eye is a dark bluish-black stripe ; back and sides of the neck, as also the back and tail feathers, slaty-brown : wings the same but darker. Beak dark cinereous or greyish-black, and the legs and feet yellowish flesh-colour. Length 3 feet, breadth 7 feet. Irides yellow.

On the 21st October, in latitude 37°14′ south, longitude 69°8′ east, thermometer 63°, with a dead calm, we saw several albatrosses apparently of different species.

One of these birds came following up the wake of the ship, so closely and with his eyes so intent on the water, that at first I thought he was coming on board, but when he saw me standing on the poop, he turned suddenly across the wake; at the same time I jerked up the line with which I was fishing for them, and luckily struck him on the wing, which throwing him off his balance, obliged him to settle on the water from whence he might have made his escape with ease, had he not in a fit of rage, and spite at being struck with the line,

turned round to bite the innocent means of his discomfiture; by so doing, however, he contrived to entangle his wing, and to my great joy I succeeded in hauling him on deck, unspotted and unharmed in plumage.

He belongs also to the genus diomedea, or albatross, but whether a young bird, or a distinct species from the large white-bodied bird usually known to sailors by that name, I cannot positively determine, as I have never had an opportunity of comparing them; but from the description of both, I am inclined to think them distinct.

The breadth from tip to tip of the expanded wings is six feet; and its length from tip of beak to end of tail 2 ft. $5\frac{1}{2}$ in.

The whole of the under parts are pure white, as are the rump and upper tail coverts; the wings and back and tail feathers are of a very dark chesnut-brown; the head and back part of the neck are white, faintly clouded with a tinge of bluish ash, which gradually grows darker as it joins and blends with the dark colour on the back.

The legs are of a very pale bluish-white. The beak is very beautifully marked on the ridge of the upper mandible with a line of clear bright yellow, which is well set off by the rest of the beak being of a jet black, except the hook, which is rosy flesh-coloured, and is a continuation of the yellow line.

At the base of the lower mandible is a small caruncle, stretching on each side from the edge to the bottom of the bill in a narrow line of deep orange-yellow. The eye has a narrow stripe of bluish-black running through it, and blending with the plumage on the back of the head and neck. Irides hazle.

On examining the gizzard of this bird, we found the eyes of a fish, which, to judge from their size, must have been from a pound and a half to two pounds in weight.

Both of these specimens had a beautifully soft white down, very close, beneath their feathers.

Whenever the Cape pigeons alighted upon any thing, the albatross immediately perceived it, and sweeping over the waters with outstretched wing, threw himself into the midst of them with a hoarse croaking scream, and obliged them to abandon the prey to him.

On first alighting on the water the albatross holds his wings half-folded high over his back, and if he finds any thing to devour, slowly folds them in on his sides; but if he is disappointed in obtaining prey, he throws forward his head and neck, and once more expanding his long wings, runs with three or four splashing steps on the wave, and then rising gradually into the air, skims along with incredible strength and rapidity.

Nothing can be more majestic than the long, sweeping flight of this bird, as he skims closely over the face of the deep, almost without moving his wings, which are kept at full stretch, until he suddenly throws himself far above the waves, and then with a long sweep dashes down again, and skims away as before for many yards without any apparent motion of the wing, save now and then a slight bending near the tip as he avoids the foaming crest of a wave. They always alight on the water before taking their prey, holding the head and neck very erect when swimming, and looking both bold and graceful.

The sooty albatross (Diomedea fuliginosa), called by the officers of the ship, a "*Peeroo*," is both more numerous and more familiar than the other kinds, and flies rather differently, not sweeping so long and steadily over the surface of the deep as the larger albatrosses, and rising far above the yards, impudently skirting the sides of the ship, and looking down upon the decks*; they flap their wings frequently in flying, which the larger birds do not. If the weather is calm, however, and the wind very light, they all flap their wings oftener, so that the above description is more applicable to windy weather.

The sooty albatross or Quaker bird, was first seen on the 26th September, latitude 33°30′ south, longitude 3°5′ west, thermometer 54, weather cold wind variable; and left us on the 26th October in latitude 33°34′ S. longitude 77°16′ E. thermometer 59½°. Thick hazy weather; wind S. S. E.

The other albatrosses continued to be seen until the 29th October, in latitude 29°37′ S. longitude 82°28′ E. thermometer 69°. Fine weather; wind easterly.

In GRIFFITH'S translation of CUVIER, the petrels are stated to "drop upon their prey with extreme promptitude, and carry it off with their bill, as with a harpoon: but they have not the habit of diving to attain it. They are in fact never seen to submerge, and when the animal they are watching is somewhat below the surface, they sink a portion of their body in the water to seize it."

This is not correct, as the petrels, or at least the Cape petrel, as I have already stated, can dive very prettily, and I frequently saw them do so, after the pieces of pork which we threw overboard to them. They certainly alight very quickly upon their prey, but not with the sudden and headlong rush of the rapacious tribes, as the word "*drop*" would lead one to expect. It must however be remembered that I speak only of the Cape petrels, which also devoured their prey before rising from the water: other species may perhaps act differently.

* Perhaps COLERIDGE may have alluded to this bird, in his "Antient Mariner."

I am happy to find that my description of the manners and flight of the albatross agrees so nearly with that of the author just mentioned. He says, however, that this bird constantly dips its head below the surface of the water, during its flight, in search of food.

This I never saw, although I have sometimes watched them for the greater part of the day. Like the Cape petrel they always settled before they seized their prey, and never rose until they had devoured it.

As truth is the grand desideratum in all scientific researches, I do not think it necessary to offer any apology for having set forth my remarks in opposition to those of more experienced men, because I have stated no more than what actually passed under my own observation: whereas the authors above mentioned have written in a great measure from hearsay, and consequently may have been obliged to take on credit a great deal of unauthenticated matter.

[We regret that we cannot find room for Lieut. HUTTON's daily Journal, kept during his voyage to India. We presume however that the principal facts in natural history observed by him have been alluded to above.—ED.]

VII.—*Account of* Oxygyrus; *a new Genus of Pelagian Shells allied to the Genus Atlanta of* LESUEUR, *with a Note on some other Pelagian Shells lately taken on board the Ship Malcolm. By* W. H. BENSON, *Esq. Bengal Civil Service.*

The following characters of a new Pelagian shell, taken on the surface of the Southern Atlantic and Indian Oceans, may prove interesting to naturalists, inasmuch as hitherto only one genus of the family, viz. *Atlanta*, has been discovered; and of the remaining family of the order, a single genus, bearing a shell, is known, that of *Carinaria*, of which scarce and beautiful groupe we took, in the Indian Ocean, two new species, which I hope shortly to describe and illustrate. The shell of the genus *Atlanta* was first made known by LAMANON, in a paper sent to France during the progress of LA PEYROUSE's voyage. Overlooking the absence of septa, he called it "Corne d' Ammon vivante." The only specimens he met with were dead, and were taken from the stomachs of Bonetas, which he supposed to have brought them up from great depths, little dreaming that hundreds of living specimens were nightly within his reach on the surface of the Ocean. Lately the genus has been re-discovered by the American French naturalists, the animal has been referred to its proper place in the system, and a scientific name has been conferred upon it by M. LESUEUR. I now come to my description of the allied genus, which

from its most obvious distinguishing character, the rapidity of convolution, I have named *Oxygyrus*. From ὀξυς velox, and γυρόω incurvo.

Class— *Gasteropoda*, CUVIER.

Order—*Nucleobranchi*, BLAINVILLE.

Fam. *Atlantidæ*, RANG.

Genus, *Oxygyrus*, mihi.

Char. Gen. TESTA *subcartilaginosa, discoidea, cito convoluta, duobus lateribus similibus, utroque latere profundè umbilicata; anfractibus exterioribus antecedentes ferè amplectentibus; anfractu ultimo latè et acutissimè carinato; carinâ ab ore usque ad dimidium periferiæ extensâ, illuc desinente, extremitate angulatâ; aperturâ cordiformi, sinu carinam intrante.*

Operculum cordiforme, medio depressum, subcanaliculatum.

ANIMAL *spirale, capite proboscidiformi, tentaculis duobus brevibus cylindraceis, oculo magno saliente ad basin exteriorem munitis; ore terminali; branchiis pectiniformibus, inter jecur et penem obliquè sitis; pede alâ natando aptâ, foliaceâ, lobis duobus præditâ; lobo majore versùs extremitatem dilatato, cyatho ad latus posito; minore oblongo-ovato, membranaceo, tenuissimo, margine dentato, quasi rupto, operculum facie inferiore gerente; operculo corneo.*

Shell subcartilaginous, quickly convolute; the first whorls being nearly enveloped by those succeeding, discoid, symmetrical, deeply umbilicated on each side; last whorl broadly and sharply keeled from the edge of the mouth to about half the circumference; keel angular at its posterior termination; aperture sinuous, heart-shaped, not entire, being encroached upon by the preceding whorl; peritreme acute, with a narrow slit or sinus on the front edge, running into the keel, which is there double.

Operculum heart-shaped, depressed, and channeled with a medial line.

Animal spiral. Head proboscidiform, with two short cylindrical tentacula, having a large prominent eye on the exterior base of each. Mouth terminal. Branchiæ pectiniform, lying obliquely between the liver and the male organ. Foot a foliaceous swimmer, having two lobes, the larger widening toward the extremity, and having a lateral sucker; the smaller lengthened anteriorly, extremely thin, jagged, and bearing the operculum on its under surface. Operculum horny.

The animal much resembles that of *Atlanta*, but differs in the form of the greater lobe, the position of the sucker, and the foliaceous appendage to the operculated lobe of the foot, which is traversed by veins having the appearance of tendons, which admit of the contraction of the organ. The proboscidiform head is more swelled towards

the centre and base, and is broader than that of *Atlanta*: the tentacula are much smaller in proportion, and the centre of the spire is occupied by the dark brown mass of the liver: whereas in *Atlanta* this part appears to be filled with a series of forms resembling ova.

The shell differs principally in having whorls closely convolute, and partly enveloping the preceding ones; while in *Atlanta*, the whorls are loosely rolled*, and the keel (which stops short at half the circumference in *Oxygyrus*) runs on between the whorls, and connects them together. In *Atlanta* the form of the mouth, which is entire, is elliptical, with an operculum of the same shape. In *Oxygyrus* the operculum is cordiform, corresponding to the form of the aperture, and in the only species yet discovered the shell is cartilaginous, while in *Atlanta* it is testaceous. This cartilaginous shell shrinks in drying, particularly the last whorl, the centre ones appearing to be of firmer consistence. In the species described, the shell is tumid, herein widely differing from the very compressed and flattened form of *Atlanta*.

Having sketched the animals of both shells while alive, under the lens, I can speak confidently regarding their affinity, which I had noted as probable, before I had an opportunity of examining the animal of the new genus.

Like *Atlanta*, the animal moves by sudden starts, quickly agitating its swimmer. It occasionally adhered to the bottom of the vessels in which it was placed, by its sucker, which then was flattened out to the surface to which it adhered.

We first met with the shell in the Southern Atlantic from S. Lat. 15° to 20° 30′ and between W. Long. 29° 30′ and 23° 30′. In the Southern Indian Ocean, we again met with it in 29° 30′ S. Lat. and 32° E. Long., and it continued to occur at intervals up the Bay of Bengal to N. Lat. 17° and E. Long. 87°. It has therefore a very extensive range of sea and climate, and I am surprised that the French naturalists, who have of late swept the seas with so much zeal and success, have not met with it.

The animal comes up to the surface, with the *Pteropodous mollusca* and the *Firolidæ*, shortly after sunset, and may then be taken with the tow-net. With this apparatus I was extremely successful, during my late voyage from England, in procuring Pelagian shells, as the following catalogue will shew. My example being followed by two other passengers, we allowed but few objects on our route to escape us. I was also enabled, with a throwing-net, to capture such large shells as were visible from the poop, and which would have otherwise

* Note.—Oxygyrus bears to Atlanta nearly the same relation that Orbulites does to Ammonites.

passed at too great a distance from the vessel to have fallen into the line of the tow-nets.

Gasteropoda.

1. *Janthina*, 6 species.
2. *Litiopa* (RANG.), 2 species.
3, 4. Two new genera, which I have not yet sufficiently examined.
5. *Carinaria*, 2 new species.
6. *Atlanta* (LESUEUR), 2 species.
7. *Oxygyrus*, mihi, 1 species.

Pteropoda.

8. *Limacina*. A single new reversed species, being the second discovered of the genus, hitherto confined to Arctic regions. I took an unique specimen in Lat. 40° S. Long. 33° E.
9. *Hyalæa*, 9 species.
10. *Cleodora*, 3 species.
11. A new perforate genus allied to Cleodora *(rarissimum)*.
12. *Cresis*, (RANG, Manuel des Mollusques, page 115,) 3 species.
12. *Cuvieria*, (RANG.) 2 species. Our capture of two perfect specimens of this shell will enable me to correct the character given by RANG, from imperfect specimens. Out of the number caught by us we took only two perfect specimens, one of which I unfortunately broke, its excessive fragility reducing it to the state in which RANG has described it.

Cephalopoda.

14. *Argonauta*, 1 new species.
15. *Spirula Peronii.*

Cirrhipedes.

16. *Anatifera*, 2 species.

Iacertæ Sedis.

17. *Campylonaus* (mihi). A new genus, which I am unable to assign to any known class or order, from the three specimens taken by Lieut. McNAIR being defective of the animal. I can only conjecture that it may belong to the *Firolidæ*, and that it is probably related to *Carinaria*.

It only remains to give the specific character of Oxygyrus.

O. inflatus. Testa tumida, anfractibus transversè confertim striolatis; suturis profundè excavatis.

Shell tumid, whorls transversely and closely striate; sutures deeply cut.

Calcutta, Feb. 21st, 1835.

VIII.—*Proceedings of the Asiatic Society.*

Wednesday Evening the 11th March, 1835.

The Rev. W. H. MILL, D. D. Vice-President, in the chair.

Captain T. M. TAYLOR, proposed at the last meeting, was duly elected a member of the Society.

The Chevalier General VENTURA and M. A. COURT, proposed as honorary members at the last meeting, were unanimously elected.

The Honorable GEORGE TURNOUR, of the Ceylon civil service, was proposed as an honorary member, by Dr. MILL, seconded by Mr. J. PRINSEP, and referred to the committee of papers.

The Secretary announced that two vacancies had been caused in the committee of papers by the departure of Captain TROYER and Dr. TYTLER, for Europe; upon which a ballot was held, and Mr. H. T. PRINSEP and Captain PEMBERTON, were elected by the majority of votes.

Read a letter from C. K. ROBISON, Esq. intimating, with reluctance, that he was compelled to withdraw from the Society.

Read a letter from Dr. J. T. PEARSON, stating that in consequence of his residing at such a distance from the museum of the Society, he could not any longer perform the duties of Curator, and therefore tendering his resignation of the situation, and proposing that a person be sent for in that capacity from England.

Resolved, that the thanks of the Society be presented to Dr. PEARSON, for his past services, and that the subject of his present recommendation be referred to the committee of papers.

Read a letter from Mr. C. TREBECK, on the subject of his brother's and Mr. MOORCROFT's manuscripts. The Secretary also had received a letter from Mr. W. FRASER of Delhi, offering to place such papers as were still with him in the hands of the Society, on condition of their being published for the sole benefit of the author's family.

Referred to the committee of papers.

Read a letter from Monsieur E. BURNOUF, Secretary to the Asiatic Society of Paris, acknowledging his election as an honorary member, and noticing the receipt of the 17th volume of the Asiatic Researches and 1st volume of the Journal of the Asiatic Society.

Library.

Read a letter from Captain H. HARKNESS, Secretary to the Royal Asiatic Society, forwarding the 3rd part of the 3rd volume of the Society's Transactions, also the first part of the New Quarterly Journal.

Read a letter from H. T. PRINSEP, Esq. Secretary to the Government of India, General Department, forwarding on behalf of the Right Honorable the Governor of Bengal, a copy of the 1st volume of Colonel BEAUFOY's Nautical and Hydraulic experiments, with numerous Scientific miscellanies.

Read a letter from Baron SILVESTRE DE SACY, presenting his recent publications as follows:

De L'ASIE, ou Considerations, Religieuses, Philosophiques, et Litteraires, sur L'ASIE, 4 vols.

Extrait Du Sefer Tahkemoni.

Notice sur La Vie et les Ouvrages De M. CHAMPOLLION LE JEUNE.

Discours prononcé à la Sèance Generale de La Societé Asiatique du 29 Avril, 1833.

Alfiyya ou La quintessence de la Grammaire Arabe, ouvrage de DJEMA'L-ED-DI'N MOHAMMED.

The following books were presented on the part of the Royal College of Surgeons of London, with a letter from Sir ANTHONY CARLISLE.

Catalogue of the Library of the College of Surgeons.

Descriptive and illustrated catalogue of the physiological series of comparative anatomy contained in the museum, vol. 1st.

Catalogue of the Hunterian collection in the museum, in 5 parts.

Memoir on the Pearly Nautilus, with illustrations of its external form and internal structure, drawn up by RICHARD OWEN, M. R. College of Surgeons.

Alleged discovery of the use of the Spleen and Thyroid gland, by Sir A. CARLISLE.

The following works were also presented.

Report of the third meeting of the British Association for the advancement of science—*by the Association.*

Madras Journal of Literature and Science, Nos. 5 and 6—*by the Madras Literary Society.*

The Indian Journal of Medical Science, Nos. 14 and 15—*by the Editors.*

Journal Asiatique, No. 78, September, 1834—*by the Asiatic Society of Paris.*

Ciceronis Opera Omnia, printed in the year 1596—*by Dr. J. Tytler.*

A valuable Aldine edition of Herodotus, printed in 1513—*by Ditto.*

The following works, published by the Oriental Translation Fund, were received from the London Committee.

Tohfut-ul-Majahideen, an Arabic history, translated by Lieut. M. J. ROWLANDSON.

An essay on the Architecture of the Hindus, with 48 plates, by RA'M RA'Z, native judge, Bangalore.

Travels of Macarius, part 5, translated by C. F. BELFOUR.

Travels of Evliya Effendi, in Europe, Asia and Africa, in the 17th century, translated from the Turkish—by R. J. VON HAMMER.

Description of the Burmese Empire from the MS. of father SANGERMANO, translated by W. TANDY, D. D.

Alfiya, an Arabic Grammar, by the Baron SILVESTRE DE SACY.

Fifth general report of the proceedings of the Oriental Translation Fund, 1834.

The following books were received from the booksellers.

Lardner's Cabinet Cyclopedia, Middle Ages, Vol. 4th.

———————————— British Admirals, Vol. 3rd.

Illustrations of Indian Zoology, Parts 15, 16, 17, and 18, (two in one.)

Illustrations of the Botany, and Natural History of the Himalayan Mountains, &c. Part 4th. By F. J. ROYLE, Esq. F. L. S. and G. S., M. R. A. S.

The Secretary reported the completion of the Index of the first eighteen volumes of the Asiatic Researches, and submitted a Bill from the Military Orphan Press, for Rupees 1210, being the expence incurred in its publication, which was ordered to be discharged, and thanks were voted.

Museum and Physical.

The Secretary announced that he had been requested by Lieut.-Colonel BURNEY to beg the Society's acceptance of the collection of fossil bones from Ava, exhibited at the meeting of the 6th August, 1834.

The best thanks of the Society were voted for this splendid and costly present.

A note was read from Mr. J. H. STOCQUELER, presenting for the Museum a spear, knife, and mallet, used by the nations of King George's Sound.

These very primitive implements are made by cementing sharp splinters of flint upon the side or end of a stick with a kind of tough pitch. The mallet, formed of two rounded stones attached in the same manner, is used for indenting the gum tree, up which the aborigines climb in search of the opossum, and also for killing the animal:—the pointed end of the knife for skinning him.

Three specimens of the *navicella tessellata* (LAMARCK), found adhering to piles in the Húgli river, Fort William, were presented by W. H. BENSON, Esq.

Read, extracts of a letter from Lieut. WM. FOLEY, dated 6th January, forwarding some specimens of Sulphuret of Antimony, occurring in vast quantities in a hill near Moulmein.

Extracts of various letters from Captain CAUTLEY and Dr. FALCONER, describing the progress of their explorations in the Siwálik hills.

The rhinoceros, hitherto a desideratum in their fossil cabinet, had at length been recognized by seven veritable molar teeth. The Museum at Seharanpur is now so richly stored with subjects, that it will be better to await a full account of it from the meritorious founders of it themselves, than to publish the detached notices we have hitherto ventured to glean from their private correspondence: but we could not refrain from announcing to the world the rapid progress made at the onset, in this remote theatre of discovery.

Some vegetable stalactitic kankar and fossil shells of the Gawelgiri hills were presented with notes by Dr. MALCOLMSON of Madras.

Antiquities and Papers Communicated.

A letter from Dr. G. E. RANKIN, dated Riewara 7th February, 1835, was read, forwarding a facsimile of an inscription from the ruins of a Hindu temple on the hill of Harsh in Shekawati, about 40 miles north of Sambhur, and seven or eight south of Seekur.

A letter from Lieut. NEWBOLD, communicating a Memoir on the History and Government of Naning.

Also a sketch of the four Menang Cabowe States in the interior of the Malayan Peninsula, by the same author.

The following valuable papers and documents were submitted and presented by Lieut.-Colonel H. BURNEY, resident in Ava.

A chronological account of the kings of Siam, obtained from the rightful heir to the Siamese throne, now residing as a druggist at Ava.

Translation of an epitome of the kings of Prome, Pagan, and Ava, drawn up by order of the king of Ava for Colonel BURNEY.

Translation of the official registers of the population of the Burmese Empire made in 1783, and revised under the present king in 1826.

The whole population of Burma proper from these documents, exclusive of the "wild tribes," only amounts to 1,831,467 souls.

Translation with critical explanation of the proclamation made every month in the city of Ava, as noticed by CRAWFURD, enjoining the inhabitants to observe certain moral precepts.

Colonel BURNEY having kindly undertaken to look over these papers, and prepare them for the press, they were re-delivered into his charge for the present.

A description of the ruins of an extensive ancient town called Pora in Assam, was communicated by Captain WESTMACOTT, Assistant to the Political Agent on the N. E. Frontier.

[This will be published in our next.]

The following particulars of some singular ancient monuments in the neighbourhood of Hyderabad, were communicated in a letter to the Secretary from Dr. S. G. MALCOLMSON of Madras.

"Your remarks on the liquid from the Manikyála tope induce me to think, that a notice of the singular tombs near Hyderabad may be interesting. There is an account of them in a volume published by the Madras Society some years ago from the pen of Captain YOUNG. They differ in appearance very much from those figured by Mr. BABINGTON, and also from some in Mysore, mentioned in Colonel WELCH's book; but are exceedingly like the smaller, and ruder Druids' circles, and in some no square coffin or "kiot" is found, their place being supplied by the small stones and soil, which contains much clay, and some iron and lime, and becomes naturally very hard when pressed together. In none did any mortar seem to be used. Captain YOUNG found bones and even skulls. I was not so fortunate, although very anxious for a skull, being in hopes of ascertaining that they had been monuments of the same people, whose remains are found in some parts of Russia. Some of the graves had been opened before, and I believe that in these skulls had been found. In those I opened, there were many of the earthen vessels of very different shapes, and the more perfect ones contained a peculiar soft almost unctuous looking earth, in thin layers of a white and dark-gray color. In some places there seemed to be a white powder like ashes interposed between the dusky layers."

The contents of two of the jars were sent up as first extracted; but they seemed to contain little or no animal matter:—the earth from its stratification in their horizontal laminæ had evidently been deposited by gradual infiltration during a long course of rainy seasons, until it had completely filled the vessels. Dr. M.'s sketches of the jars are engraved at the foot of Plate VII. "No. 1 was found inserted into one of the long jars, and probably answered as a cover. The mouths of it and of No. 5 had a more graceful curve, and in this respect had a distant resemblance to some ancient vases."

Adverting to Mr. HODGSON's opinion that Buddhism had preserved an identity of character in all times and places, Dr. MALCOLMSON writes:

"In May, 1828, I passed through a town called Bandock, 18 miles from Chandá, on the road to Nágpur, and finding many Hindu ruins well sculptured on the sandstone of the district, I spent the day in examining

them. To the greater number I could give names, but one insignificant head, much injured, struck me as having the composed sleep-like appearance of the Buddhist sculptures. This induced me to make some inquiries, and I soon heard that in a hill two miles off there was a cavern, and on reaching it I found an excavation consisting of three parts, the principal of which penetrated 20 paces into the rock, but was narrow in proportion to its length. In a small apartment at its extremity was a sitting Bauddha figure, six feet high. The passage was arched with several recesses on each side, and near the entrance, the two other portions of the temple extended 10 paces into the rock, like the arms of a cross, and were in every respect similar. A rude outline of Buddha could be traced on the rock, where it was smoothed away on each side of the mouth of the cavern. There was a figure of Durga inside the temple, and one at the door, on separate pieces of stone, and of modern appearance. The small head which first attracted my attention was found amongst the rubbish of a ruined temple, which some Jain Banians in the town were engaged in removing in search of their images, and amongst these I found several of the naked figures, (four or five feet high,) with curly hair, and differing amongst themselves, usually found in Jain temples, and also representations of Buddha in the sitting posture, with the hands laid over each other, the palms uppermost, the hair curly, the forehead wide, with little figures kneeling before him, and others fanning him; amongst them was a figure of Durga. The Jains have also a modern temple there."

Adverting also to the same subject, Dr. R. Tytler mentioned to the meeting, that he had remarked while in Scotland, the close resemblance of "the little steeple at Brechin" to a Buddhist monument. The same remark has frequently been made of the Round Towers of Ireland. He had written a note on the subject in the Freemason's Review, for October, 1834, which he presented.

"The little steeple of Brechin consists of a beautiful slender cylinder or hollow pillar, about 80 feet high, with 60 rows of smooth stones, cemented by mortar, and is surmounted with a cone of masonry of a subsequent period of architecture. On the western front are sculptured figures of an *elephant*, having the feet of a lion, and a *horse:* each 11 inches long and 8 broad. The combination of the elephant and lion is observable on the temples of Java, and in many statues of Buddha elsewhere."

A note from B. H. Hodgson, Esq. Resident at Nèpal, forwarded drawings of the Láths or columns at Bakra in Tirhut, at Arahráj in Saran, and of the mound at Kesriah, in the former district; with exact *fac-similes* of the inscribed characters on the two pillars.

Lieutenant A. Cunningham, Engineers, forwarded the facsimile of an inscription on a stone slab extracted by him from the Buddhist monument at Sarnáth near Benares.

A note by the Secretary on the same subject, and on the inscribed pedestal of the Bauddha image, presented at the last meeting, was read.

[See the foregoing pages of the present number.]

Upon the close of the regular business of the evening, Dr. R. Tytler exhibited to the meeting several interesting experiments in Electro-mag-

netism, concluding with the *experimentum crucis* of Dr. FARADAY, by which the identity of the galvanic and magnetic fluids, is considered to be finally established. The magnetic spark was produced continuously by SAXTON's rotating apparatus, of which a description will be found in the Arcana of Science for 1834.

Wednesday Evening, the 1st April, 1835.

The Honorable Sir EDWARD RYAN, President, in the chair.

The Honorable GEORGE TURNOUR, of the Ceylon Civil Service, proposed as an Honorary Member at the last Meeting, was unanimously elected.

Captain M. G. WHITE, Sen. Asst. Commissary, Arrakan, proposed by Mr. W. H. MACNAGHTEN, seconded by the Honorable Colonel MORRISON.

Professor LEA and Dr. HARLAN, of Philadelphia, were proposed as Honorary Members by Mr. J. PRINSEP, seconded by Mr. MACNAGHTEN.

Read a note from JOHN LACKERSTEEN, Esq. enclosing a letter from the Right Reverend JEAN LOUIS, Bishop of Isauropolis, and Vicar-Apostolic of Cochinchina, Camboge, and Ciampa.

The Reverend gentleman's letter, in French, stated, that he had in his possession a manuscript Dictionary, Cochinchinese and Latin, originally prepared more than 40 years ago by his predecessor, Monseigneur PIGNEAUX, Bishop of Adran, and revised and much augmented by himself during 14 years' residence in the country. He had also nearly completed a second volume of the same materials reversed, or Latin-Cochinchinese, and he had prepared a grammar of the same language in Latin, adopting for all three works the Roman alphabet, in lieu of the complex hieroglyphic characters of the country, which somewhat resemble those of China, but have different powers.

These three volumes he tendered to the Asiatic Society, requesting to be informed of its intentions in regard to their publication. If it were possible to print them at Penang, where the Bishop and a few of his Cochinchinese converts have sought refuge from the severe persecutions to which the Mission has been subjected by the present king (who owes his seat on the throne to this very mission), he would there undertake the revision of the proofs: or if it should be necessary, he would proceed to Calcutta for the purpose of superintending the publication under the auspices of the Society. In the latter case, he must look to the Society for pecuniary aid, as all had been lost to the mission, through the cruel treatment it had lately endured.

Resolved, that this important communication be submitted to the Committee of Papers, who will make the requisite inquiries regarding the work, and report on the expediency, and on the means, of effecting its publication.

Library.

Mr. C. E. TREVELYAN, presented, on the part of the author, a copy of the *Jáme Bahádur-khání,* an epitome (4to, 600 pp.) of European sciences in the Persian language, compiled by KHAN BAHADUR, son of Rája MITRA JÍTA of Patna, including treatises on astronomy, optics, and mathematics, and copious tables of logarithms for natural numbers, sines, tangents, &c. Also, a small octavo volume on Perspective *(Ilm-ul Manázarat),* in the Persian language, by the same author.

Mr. H. PIDDINGTON presented a copy of the Transactions of the Geological Society of Pennsylvania, for August, 1834.

Meteorological Registers, for Jan. and Feb. 1835—by the Surveyor General.

From the Book-sellers.

LARDNER's Cabinet Cyclopedia, SWAINSON's Natural History.

Museum and Antiquities.

Read a letter from Mr. W. DAWES, of the Delhí Canal Establishment, forwarding at the request of Lieut. KITTOE, a drawing of an image found about 10 years ago near the Herrod Ghat, on the western branch of the Jumna, and offering, if desired, to send the image itself to the museum. *Resolved*, that the offer be accepted with thanks.

A notice by B. H. HODGSON, Esq. of an inscription in Tibetan and Lantsa (correctly Ranza) characters, on a temple on the confines of Tibet, was submitted.

[This will be printed in the next number of the Journal.]

Physical.

The President brought to the notice of the Society Dr. PEARSON's suggestion regarding the Curatorship. He had conversed with the Baron HUGEL (who was present at the Meeting) on the subject of procuring a competent person from Europe, and was assured that a salary of 150 or 200 rupees per mensem would be ample. The funds were in a state to warrant the measure. He therefore proposed, and it was resolved, that a Special Committee, consisting of the Honorable Col. MORRISON, Mr. W. H. MACNAGHTEN, Dr. PEARSON, with the President and Secretary, be formed for the purpose of carrying the measure into effect, limiting the vote of salary to 200 rupees, and empowering the Committee to arrange other incidental expences with reference to the present means of the Society.

Read a letter from Serjeant DEAN, dated Delhí, the 20th March, acknowledging the receipt of the remittance of Rupees 100, on account of the expences incurred by him in transmitting fossil bones and other specimens, and announcing further contributions from himself and friends.

A letter from Lieut. N. VICARY, forwarding a small box of fossil bones from Julalpur, on the banks of the Betwa river; also some fossils of the Alligator, from between Chunar and Mirzápur on the Ganges; and a specimen of limestone from Landour, with impressions or erosions by water similar to those alluded to by Dr. MCCLELLAND.

Some of the bones from the Betwa, the metacarpus and femur of an ox, were lined with beautiful crystals of dog-tooth spar, which was also remarked lining the cavities of the kankar conglomerate forming the matrix in which they were imbedded.

Mr. BENSON, who was acquainted with this fossil site, stated his opinion that they were of modern fossilization, being found abundantly in the bed of the Betwa river.

Mr. H. B. BENSON exhibited to the members present, the collection of shells made by him on his recent return to India, comprising many new genera and species.

[Notices of this collection will be given in the Journal.]

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of March, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain, inches.	Wind.			Weather.		
	Standard Barometer at 32°.	Wet Barometer, do.	Adg. Ten. deduced.	Ther. in air.	Diff. or M. T. Depress.	Leslie's dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Adg. Ten. deduced.	Thermometer in air.	Different.	Leslie's dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	Evening.
1	29,820	3,949	0,871	77,5	....	4,2	96	,710	,677	1,033	80,3	10,2	....	82	66,0	....		s.	sw.	se.	clear.	clear.	hazy.
2	,879	,983	,905	79,3	....	4,2	97	,732	,635	1,037	82,5	8,8	....	86	65,0	....		s.	sw.	se.	do	do	clear.
3	,871	,966	,905	78,5	....	5,1	95	,732	,695	1,067	81,3	16,4	....	62	65,2	....		s.	sw.	S.	haze.	do	do
4	,964	,990	,974	78,9	....	5,8	93	,832	,766	1,066	81,3	10,4	....	82	65,7	....		SW.	se.	se.	do	hazy.	fine.
5	,932	,061	1,007	77,5	....	4,4	96	,803	,749	1,054	82,1	9,8	....	85	63,5	....	0,15	w.	S.	S.	clear.	fine.	do
6	,943	,992	,951	78,3	6,3	8,7	83	,819	,662	1,157	83,6	16,6	....	52	70,5	....		sw.	nw.	nw.	cum.	cum.	clear.
7	,934	,964	,970	78,7	2,7	3,2	89	,790	,562	1,228	86,3	11,3	....	61	64,5	121,0		sw.	sw.	sw.	th. fog.	clear.	do
8	,880	,877	1,003	81,1	....	....	95	,790	,600	1,180	85,1	....	....	85	63,4	....		sw.	S.	S.	do	do	do
9	,046	,954	1,092	79,9	....	....	86	,869	,733	1,081	82,3	12,2	14,1	78	66,1	....		n.	nw.	nw.	cl.	do	do
10	,007	,087	,920	78,7	10,0	8,5	84	,878	,760	1,118	81,6	13,6	14,8	73	66,4	117,5		nw.	o.	n.	cum.	clds.	do
11	,998	,031	,967	79,2	9,3	8,3	83	,870	,756	1,114	82,9	12,7	14,4	76	66,2	121,5		o.	sw.	nw.	clear.	clear.	cumuli.
12	,994	,999	,995	80,9	10,7	9,8	84	,830	,699	1,131	84,5	13,2	14,6	78	69,1	127,1		o.	se.	sw.	do	do	cldy.
13	,968	,994	,994	80,7	6,4	4,6	96	,842	,859	0,983	79,9	8,7	9,8	86	67,8	95,8		o.	s.	nw.	cloudy.	overcast.	do
14	,950	,000	,950	80,5	6,2	4,4	96	,836	,824	1,012	80,6	8,2	8,8	88	64,4	119,0		W.	W.	S.	cum. st.	do	hazy.
15	,945	,002	,883	77,2	5,9	4,0	97	,820	,890	0,930	78,1	5,3	6,4	95	65,5	88,5	0,70	e.	e.	w.	hard rain.	rain.	overcast.
16	,910	,060	,850	76,2	4,7	3,4	98	,787	,827	0,960	76,8	5,2	6,8	95	66,5	103,5		o.	sw.	w.	overcast.	overcast.	cloudy.
17	,906	,972	,934	77,7	3,6	2,5	99	,789	,789	1,000	81,3	8,1	8,9	88	66,6	114,2		o.	sw.	s.	cumuli.	cloud.	overcast.
18	,958	,020	,932	78,1	3,4	2,4	99	,834	,722	1,112	82,6	7,5	9,3	88	70,2	117,5		o.	s.	sw.	th. fog.	haze.	clearing.
19	,869	,866	1,009	79,9	5,1	4,0	96	,792	,567	1,223	87,8	13,7	15,2	73	71,2	109,6		s.	sw.	s.	do	cumuli.	clear.
20	,819	,798	1,023	80,7	4,9	3,8	95	,682	,476	1,206	86,9	12,0	13,8	79	71,4	115,0		s.	w.	sw.	scud.	fine.	do
21	,786	,699	1,086	82,5	5,1	4,3	95	,668	,392	1,286	87,9	16,9	12,4	83	72,3	126,0		S.	sw.	w.	clear.	fine.	do
22	,858	,808	1,050	82,8	13,8	12,7	75	747	,590	1,157	84,7	16,1	17,0	66	69,7	121,0		W.	W.	nw.	do	clear.	do
23	,905	,856	1,009	80,2	17,6	16,0	66	,762	,598	1,164	84,9	19,2	20,0	57	67,1	112,0		nw.	nw.	nw.	do	clear.	do
24	,906	,905	,998	79,2	16,8	15,3	68	776	,688	1,088	84,2	19,3	20,6	56	61,0	101,0		W.	nw.	nw.	do	do	do
25	,876	,881	,988	79,7	16,2	14,6	70	,744	,590	1,154	85,7	20,4	22,1	57	59,7	120,8		W.	sw.	sw.	do	fine.	do
26	,858	,882	,976	79,6	12,9	12,6	75	,740	,561	1,179	85,6	18,5	19,5	56	62,4	120,5		SW.	sw.	w.	do	clear.	do
27	,920	,888	1,040	81,1	13,0	12,6	79	,806	,570	1,236	87,7	18,5	18,6	60	66,0	132,0		SW.	sw.	sw.	do	do	do
28	,929	,880	1,049	82,5	10,6	11,0	81	,810	,576	1,234	87,9	20,3	20,5	56	71,8	129,0		S.	sw.	sw.	dew.	do	do
29	....	....	....	....	....	....	....	....	....	....	....	....	....	....	72,0	123,2		S.			th fog.	do	do
30	,998	,886	1,112	82,0	5,9	5,0	95	,830	,584	1,246	88,9	12,2	12,0	79	70,5	129,6		S.	sw.	sw.	do	cum.	do
31	,999	,880	1,110	83,7	0,7	7,4	90	,888	,616	1,272	86,3	16,6	6,6	62	71,3	130,0		nw.	nw.	nw.	cirri.	fine.	do
Mean,	29,921	,940	0,985	79,8	8,3	7,2	99	,795	,671	1,124	83,6	13,0	13,9	74	67,4	117,2	0,85	variable.			generally clear and dry.		

The instruments the same and situated as usual.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 40.—*April,* 1835.

I.—*Description of Ancient Temples and Ruins at Chárdwár in Assam. By Captain* G. E. WESTMACOTT, *Assistant, Governor General's Agent, N. E. Frontier.*

TOWARDS the close of November last, I had occasion to proceed on public duty into Chárdwár, a small district in the northern division of Central Assam, being on the north bank of the river Brahmaputra between Lat. 26° 32′ and 26° 51′, and Long. 92° 19′ and 92° 55′. It has its name from conducting to four passes of Bhután, and is bounded on the north by hills of various altitude, situate at the base of the Himálaya, and inhabited by three wild tribes of mountaineers, called *Duphlas, Akhás, and Kupah Chowahs* ;* the Brahmaputra, confines it on the south ; to the East it has the Bhairaví river, which divides it from Nondwár, and to the west the river Rhotás, which separates it from the small district of Chúteáh.

I think it necessary to state thus much in the way of introduction, to point out the precise locality of the ruins I am about to describe, as it is doubtful if many of my readers are aware of the geographical position of a district placed in so remote a corner of our possessions.

In the south-east angle of Chárdwár, a chain of granite hills, rising from two hundred to five hundred feet above sea level, and clothed with grass and forest trees, sweeps outwards in a crescent form from

* Kupah Chowah is a corruption from *kupás-chor* or cotton stealer, a name to which the people are well entitled from their predatory habits ; but the Chárdwárians stand in much awe of these robbers, and shrink from bestowing on them so uncourteous an appellative. They come of the same stock with the Akhás, from whom they differ in few respects, and are said to have divided into a separate clan about sixty years since in the reign of LACHMI' SINGH king of Assam.

the Bhairaví to the Brahmaputra. The inhabitants assert, these hills were originally called *Agníghar* or *Agnígarh*, the place or fort of fire, from their constantly sending forth flames, or, as others affirm, from a rájá named BANH having made a fort on the spot of fire: they add, that KRISHNA mounted on his garúra (a creature half-bird half-man, corresponding with the eagle of the Grecian Jupiter,) brought hither a supply of water and quenched the fires, and that in commemoration of the event the name of the hills was changed to *Porá*, which in the dialect of Assam signifies 'the burnt,' a name they still retain. I thought it possible this obscure tradition might be connected in some way with the existence at a former period of volcanos, but after an active scrutiny of the spot no traces of subterranean fire were discovered to bear out the supposition. I had taken up my abode temporarily in the neighbourhood, when I accidentally learnt there were some gigantic ruins to be seen in the wilds, respecting which the natives could furnish no satisfactory information: on proceeding in the direction indicated, I found it impracticable to conduct the search from the density of the jungle, which consisted of lofty trees entwined with parasitical plants, and reed-grass upwards of twenty feet high swarming with wild animals; these obstacles were partly removed with the assistance of some peasants, and opened to view many interesting remains of antiquity which amply recompensed me for the trouble I had taken.

The first temple I examined appeared to have faced the north, and to have been provided with a portico supported on three columns of sixteen sides; each shaft, not including the plinth and pedestal which stand four feet above the ground, measured eight feet high and five and a half in girth, and was wrought from a single block of fine granite. The shafts have sculptured capitals, while the surbases take the form of an octagon, and the plinths are circular at top, and spread into four feet, making a sort of cross that measured four and three quarters feet each way. Three gigantic stones, with the fragments of a fourth, each hewn from a single block fourteen feet long, and cut into five irregular sides of which the total showed a circumference of eight feet, seem to have formed the entablature of the entrance porch, which I judged to have been fifty-six feet long. The frieze has three tiers of carving in *basso relievo* representing scrolls of flowers; the apertures in which iron rivets were introduced can be distinctly traced, and it is evident that no cement was employed to unite the materials. The other members were too much shattered and dispersed to enable me to conjecture the form of the temple; from a great portion of the surrounding works being in an unfinished state, it affords the presumption that the architect must have met some unlooked-for interruption; and

that this and the other buildings were overthown at the same period by some hostile power opposed to the propagation of Hinduism, assisted perhaps subsequently by a convulsion of nature. Earthquakes, I need scarcely observe, are more frequent in Assam than in any other quarter of our Indian possessions, and that they accomplish so small an amount of mischief must be attributed to its never having been the custom to employ stone and brick in the construction of dwellings. All classes, from the king to the serf, build with such slight and perishable materials as grass, bambus, and timber; thus houses sustain little injury from a shock however violent, and even if thrown down could not do much mischief to their inmates*. Had time been the sole instrument of overthrowing these structures, it is but fair to suppose from the great solidity of the materials that the ruin would have been less complete, and that the fragments would have lain in a narrower compass.

Chárdwár at one period undoubtedly formed a part of the ancient and extensive kingdom of Kámrúp, but whether the city at Porá was destroyed by the Muhammedans during their invasions, or by the Ahom kings prior to their conversion to the Hindu faith; or was overthrown at a later period by the Vaishnavas in their struggles for pre-eminence with the Saivas, is alike matter for conjecture. In the absence of inscriptions and other precise information we must have recourse to the traditions current in the country, and to such historical records as are within our reach; these I now purpose to advert to.

The inhabitants of Chárdwár assert, that Rájá Banh, the founder of Porá, was a demi-god, sixth in direct descent from Brahma; they add on the authority of some work whose name has escaped me, that his dominions were situate on the banks of the Nermadá river; that he journeyed into Kámrúp, Chárdwár, and other parts of Assam, and was the first person who introduced the worship of Maháde'va into that quarter of India. The extensive walls which encompass the temples at Porá, are said to have made part of a fort or city founded by him called Lohitpúr, Sonitpúr or Tejpúr, all three signifying the

* In an ancient MS. I have met with, written according to the custom of the country on the inner surface of the bark of the *sachí* tree, a very destructive earthquake is recorded to have happened in the A. S. 1529 (A. D. 1607), when the earth opened and vomited a vast quantity of sand and water. On the 31st March last, two severe shocks were felt throughout Assam; the first cast down the stone spire of a temple at Bishnáth, fractured an idol within the shrine, and effected other damage in the province, and on the 3rd of November following there was another quake of less violence.

city of blood, perhaps in commemoration of a battle stated to have been fought there between KRISHNA and the Rájá. The 'Srí Bhagavat,' to which I referred, informs us that BANH was the son of BALI', the generous, and that he had a thousand arms, which probably means in a figurative sense that he was endued with immense strength; this power is said to have been conferred on him by SIVA, who also promised to defend his capital against external foes, in return for the pleasure he derived from the rájá's musical performance, (a talent in which he excelled,) when he played on some occasion before the god who was dancing with his votaries. On obtaining this boon, the invincible BANH subdued both gods and men, and returning to Sonitpúr surrounded his capital with fortifications of water, wind and fire, and lived there in perfect security; but when he found after a short time that none were able to oppose him, his heart was swollen with pride, and repairing to the court of SIVA he declared, that as he was indomitable the boon bestowed was worthless, and wished to know if there really was any one capable of resisting him. The god, displeased at his arrogance, presented him with a flag, which he desired him to hoist upon his palace, and promised that whenever it should fall an antagonist would appear to humble his power: delighted with the gift BANH returned home, and waited patiently the fulfilment of the prophecy.

The narrative goes on to say, that BANH had a daughter called from her extreme beauty, U'SA, or 'morning,' who was visited in a dream by ANIRUD the son of PRADYU'MNA and grandson of KÁMDE'VA; that on awaking from sleep the damsel indulged in loud laments, and was inconsolable at missing the lovely form imprinted on her memory, and which had occupied so large a share of her midnight thoughts.

One of her handmaidens, by name CHITRA-LIKHÁ or 'The Limner,' daughter to KU'MBHAND her father's minister, moved by her excess of sorrow, inquired its cause, and U'SA, reposing confidence in the attendant, related her eventful dream regarding 'a man of sable hue with lotus-eyes, long-arms, and clad in yellow garments, beloved among women, who had abandoned her in the ocean of distress.' CHITRA-LIKHÁ soothed her affliction by engaging to produce the object of her love: she painted the images of gods, of demi-gods, sages and powerful kings of the earth, of the house of BRISHNI', of ANUDU'NDAVI'*, of BALARA'M†, and of PRADYU'MNA, which last (being the likeness of her father-in-law,) as soon as U'SA looked upon she was

* VASU-DE'VA the father of KRISHNA. † Foster brother of KRISHNA.

ashamed. The limner next painted the likeness of ANIRUD, and when U'SA saw it she modestly hung down her head, and exclaimed smiling, 'This is he who has robbed me of my heart.' Recognising the portrait to be that of KRISHNA's grand-son, CHITRA-LIKHÁ left her mistress and departed for *Dwárikà* (on the sea coast near the gulf of Cach, at that period governed by KRISHNA,) and seeing ANIRUD, sleeping on a couch, she by means of enchantments spirited him away and brought him in safety to Sonitpúr. U'SA, overjoyed at the sight of her beloved, introduced him to her private apartments, and he intoxicated with pleasure took no account of time. The military guard in attendance on U'SA suspecting that some stranger had gained access to the harem and seduced the lady from her maidenly vows, waited on the prince, and apprised him his daughter's conduct had brought a stain upon his lineage. BANH, distressed at the news, repaired with some armed followers to his daughter's apartments, and surprised the lovers playing the game of chess: ANIRUD starting up on their approach, seized his bow and discharged a flight of arrows with so much precision against the hostile party that they took to flight; BANH, however, whose rage had now passed all bounds, disregarding the tears and lamentations of his daughter, seized upon ANIRUD and bound him with cords.

Meanwhile KRISHNA, having missed his grand-son during the four rainy months, was filled with anxiety for his safety, a feeling in which the other friends of ANIRUD participated, and at length intelligence of his confinement reaching them through a sage called NA'RAD, the race of BRISHNI' of whom KRISHNA is the lord, went up to Sonitpúr with twelve legions, and attacking the city on all sides broke down the walls and buildings and destroyed the orchards. Exasperated at the mischief that was done, BANH came forth with an army whose divisions equalled in number those of the foe, and assisted by SIVA who rode on his bull, and came attended by his son and votaries, gave battle to BALARÁM and KRISHNA: a bloody engagement ensued; but at length KRISHNA bewitched SIVA whose votaries fled, and slew a vast number of BANH's army.

Furious at the prospect of defeat the prince sought out KRISHNA and encountered him in single combat, but the god cut through his adversary's bow-string, destroyed his car, slew the charioteer and horses, and sounded his shell in token of exultation. KU'TABI' the mother of BANH, trembling for the life of her son, appeared naked and with dishevelled locks in presence of KRISHNA, and he ashamed at the spectacle cast down his head, an occasion which the lord of Sonitpúr immediately seized upon to make his escape, and fled for refuge to his capital.

After this event, SIVA visited KRISHNA's army with fever; but the latter not to be outdone in modes of annoyance created another fever to contend with that of his adversary, and came off victorious. The rájá now advanced a second time to give battle, holding a variety of weapons in his thousand hands, which he hurled at KRISHNA, who broke them with his discus and hewed off the prince's arms like branches from a giant tree; seeing the peril in which he stood, MAHÁDE'VA advanced and besought his brother deity to save the life of his favourite. KRISHNA made answer, that he was bound to gratify MAHÁDE'VA, and that he intended to spare the prince because he was the son of BALI and grand-son of PRAHLÁD, whose race he had promised never to destroy—'What I have done,' continued the god, 'was to subvert his pride, I have lopped off his superfluous arms, and the four which remain are quite sufficient to enable him to enjoy eternal life.' Thus assured BANH fell at KRISHNA's feet, and brought forth ANIRUD and his daughter, seated in a car richly apparelled and ornamented, and surrounded by countless armies; KRISHNA was content, and returned to his kingdom of Dwáriká.

The next account, which has less admixture of the fabulous and appears the most deserving of attention, is taken from ancient records in MS. of the Assam kings, which speak of a place called Pratáppúr, the splendid city, the capital of RÁMACHANDRA, usually known under the name of the Pratáppúriya rájá, and which can, I think, be no other than Porá. This town is stated in the MS. to have been placed on the north bank of the Brahmaputra, a little below Bishnáth; and as the entire country bordering the river from Porá eastward to Bishnáth, with the exception of a range of hills three miles above the former, where the Bhairaví enters the great stream, is covered with swamp to the extent of several miles inland; there are strong grounds for supposing that Pratáppúr and Porá are the same. The present path from Porá to Bishnáth, which is only practicable in the dry months, often runs so far as six miles from the river, and the travelling distance does not exceed twenty-six or twenty-eight miles; while to the eastward of the Porá chain, extensive morasses skirt the Brahmaputra, without interruption, as far as Chúteáh, from twenty-five to thirty miles distant. No ruins have been discovered nearer to Bishnáth than the spot indicated, and though it is possible the site of Pratáppúr may have disappeared in the lapse of ages, it must not be forgotten that it was always usual with the kings of Assam to found their capitals on the bank of the Brahmaputra or other navigable streams, and to choose a situation removed alike beyond the reach of inundation, and the chance of being swept away by the floods—advantages which are possessed by Porá in an admirable degree.

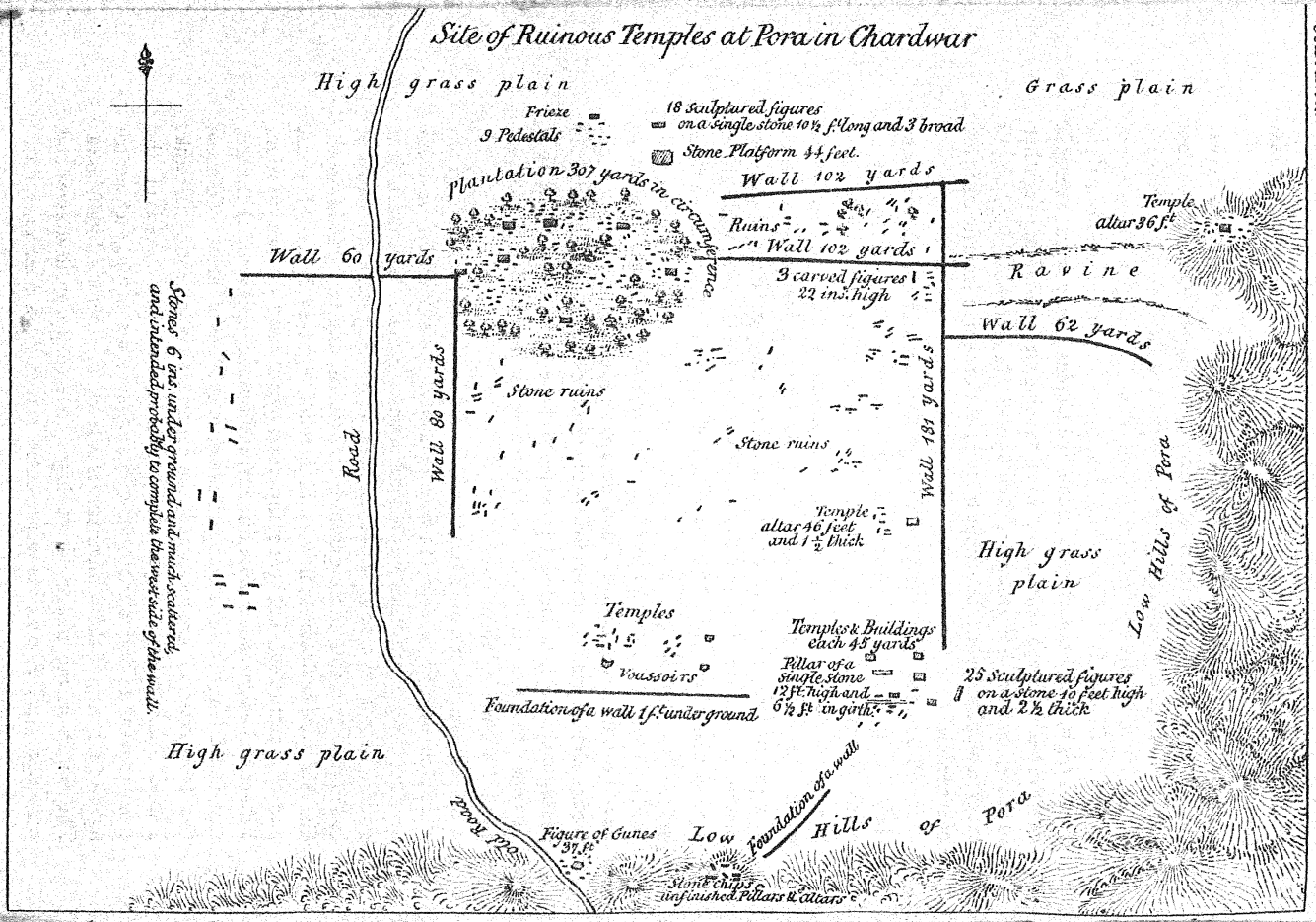
RÁMACHANDRA was, according to the volume I consulted, the twenty-fourth sovereign of a kingdom which embraced part of ancient Kámrúp, and made the eleventh of a third dynasty of its kings. SHUBÁHU the thirteenth sovereign, and ninth and last of the second dynasty, was vanquished by VIKRAMA'DITYA, and was succeeded by JITARI, a pious Chhatrí from Dabera in the Dakhan, who overcame Kámrúp, and on ascending the throne, assumed the title of DHARMA-PA'L. He was the progenitor of RA'MACHANDRA, who began to reign A. S. 1160, (A. D. 1238-9.) and is the first prince the date of whose accession is commemorated in the volume. RA'MACHANDRA is stated to have wedded with a daughter of the Kiat Rájá, who ruled a country on the south bank of the Brahmaputra, and whose subjects followed the occupation of fishermen; some remains of his capital are to be seen, it is affirmed, on the Bakaní Chaprí, an extensive island supposed to have been separated from the main land, or thrown up by the river. The princess, his daughter, was known among the people by the name of the KAMALÁ KUNRI', but in books she is styled CHANDRA PRABHÁ. She was walking one day during her husband's absence on the bank of the Brahmaputra when the god, becoming enamoured of her extraordinary beauty, fell a prey to sensual desires, and effected his purpose by embracing the princess with his waves; but another account attributes her impregnation with greater show of probability to a young bráhman of the prince's household, and declares the amour with the river god was a fabrication of the lady to conceal the lapse of which she was guilty from her parent. Passing over that part of the narrative which details the discovery of her inconstancy, and the means to which RA'MACHANDRA had recourse to put a termination to her existence, all of which failed of success, we come to the period when the princess, who had taken refuge at her father's court, gave birth to a son who was called from his beauty SHASHÁNK; his head bore the impress of an árí-fish, which marked his parentage, and hence he acquired the surname A'RIMASTHA, or A'RIMATH, *i. e.* having the head of an árí-fish. He passed his early years with the father of his mother, and subsequently removed to the north bank of the Brahmaputra, where he acquired territory; he made war upon Rájá PHENUA of Phenuágarh, in Kámrúp, where the remains of a small fort are still to be seen, and reduced that prince to subjection; and afterwards constructed a fort called Badyagarh at Háthimorá, in Kachárí mahal, which is still in existence, and made it his residence. In the course of his wars A'RIMATH extended his conquests to the kingdom of RA'MACHANDRA, of whose relationship to himself he was ignorant; he laid siege to Pratáppúr,

and through the treachery of a drummer of the garrison, who gave notice of a fitting time for attack, he surprised a part of the works that were imperfectly defended, made himself master of the fortress, and beheading RA'MACHANDRA returned in triumph to Badyagarh.

Some discrepancies are here apparent in two MSS. I consulted; one account states A'RIMATH slew PHENUA, while another maintains that PHENUA usurped the throne of A'RIMATH on the death of the latter, and abode in Phenuágarh. GAJANK, the son of A'RIMATH, succeeded PHENUA, and made his residence near Pratáppúr, in the vicinity of Agnigarh, and it is provoking that from this time no further mention is made of the place. I shall merely add, that the last named prince was followed by his son SUKRANK, who died without issue A. S. 1400, (A. D. 1478-9,) when the dynasty of Jitarí became extinct.

The destruction of the temples at Porá is ascribed by some to an apostate bráhman of Kánoj, called PORÁ SUTHAN, or KÁLÁPAHÁR, who was compelled to embrace Muhammedanism, and at whose door the Chárdwárians and others in Assam lay all the sacrilege and mischief that has been consummated in the province. From their massive proportions, and the carving and ornaments being so much worn by time and exposure, the fanes are evidently the work of a remote era; I sought in vain for an inscription, and neither the priests of the district, nor the ancient families whom I consulted, could assist my researches, or point with an approximation to accuracy, to the date of their origin.

Unconnected with the first temple, and retired some yards deeper in the wood, or rather grove of trees, which was in likelihood planted by the priests who ministered at the temples, I found the ruins of six or seven other enormous structures of granite, broken into thousands of fragments, and dispersed over the ground in the same extraordinary manner as those already described. Altars of gigantic proportions were among the most remarkable objects: one of these measuring upwards of six feet each way, and eighteen inches thick, was elevated from seven to eight feet above the level of the plain, and approached on each side by layers of stone disposed in the nature of steps. It was hewn from a single block of granite; underneath was a sort of cavern: the top had holes for iron links, and a receptacle to receive flowers and water to bedew the Nandi or sacred bull of SIVA, who was placed, my informants imagined, on the brink of the reservoir. Six or eight other altars, one of them making a square of forty-six feet, and eighteen inches thick, are to be seen in other parts of the ruins, and several square blocks, each measuring from twenty to thirty feet, concave in the centre, and sculptured in imitation of circlets of flowers,


Site of Ruinous Temples at Pora in Chardwar
High grass plain
Grass plain
Frieze
9 Pedestals
18 Sculptured figures on a single stone 10½ f.t long and 3 broad
Stone Platform 44 feet.
Plantation 307 yards in circumference
Wall 102 yards
Ruins
Wall 102 yards
Temple altar 36 f.t
Wall 60 yards
Ravine
3 carved figures 22 ins. high
Wall 62 yards
Stones 6 ins. under ground and much scattered, and intended probably to complete the west side of the wall.
Road
Wall 80 yards
Stone ruins
Stone ruins
Wall 181 yards
Temple altar 46 feet and 1½ thick
High grass plain
Low Hills of Pora
Temples
Temples & Buildings each 45 yards
Voussoirs
Pillar of a single stone 12 f.t high and 6½ f.t in girth
25 Sculptured figures on a stone 40 feet high and 2½ thick
Foundation of a wall 1 f.t under ground
High grass plain
Old Road
Figure of Gunes 37 f.t
Low Hills of Pora
Foundation of a wall
Stone chips unfinished Pillars & Altars

must have formed the Bedí or altar-place of SIVA, as there is a seat for the Ling or symbol of the deity in the middle of each.

Among the specimens of sculptured figures that fell under observation, I discerned on a portion of frieze, nine images, each about a foot high, of whom KANHEYA playing on a flute, and flanked by two Suhelís (damsels), were the only persons I could identify, though assisted by the priests of Chardwár. There were four figures of naked children eight inches high, that looked very much like Cupids; they were executed like the rest in basso relievo and were dancing or gambolling together in pairs, and another groupe of five figures, eight inches high, two of them in an obscene attitude, appeared like the others to have formed part of a cornice.

It will be seen from the sketch which accompanies this description, that the ruins are partly encompassed by walls, which extend in so many directions that it is scarcely possible to guess at the purpose of the architect. The walls have their foundations laid very deep in the earth: they are in an unfinished state, and were evidently constructed at a period long subsequent to the temples; they are built of massive blocks of cut stone, sometimes disposed in a double row, and exhibit a good deal of carving. The stones are of various shapes, and rise three or four feet from the ground, and were all intended to be united with bands of iron. The entrance of the principal enclosure appears to have been from the south, where lie some pedestals, and three or four wedge-shaped stones, about five feet long and three broad, of a flattened pentagonal shape, intended I presume to have formed the voussoirs of an arch; and the middle of the key-stone is decorated with a handsome diadem or plumed tiara.

A little to the north of the wood, buried in a forest of reed grass, which an elephant penetrated with difficulty, I discovered a very interesting fragment; this was a solid mass of granite, of a much finer grain than the kind used in the temples, measuring ten and a half feet in length, two and three-quarters in breadth, and two feet in depth. On this were sculptured, in very high relief, eighteen figures of gods, partially mutilated, but generally in a good state of preservation. Fifteen of the figures correspond in size, and are each eighteen inches high, and placed lengthwise in compartments, in groupes of threes. Of these the two external groupes, and the centre one representing, I think, PADMA' (LACSHMI), supported by two females, are raised on the stone more than half a foot above the others; and again, each centre figure (PADMA') of the compartments is more in relief than its fellows. The whole of the images have high cone-shaped head-dresses and ear-rings, and PADMA' is represented standing on a snake, and the

attendants are supported on or rising from lotos flowers. The groupes of the two divisions, which are less elevated than the others, exhibit, I believe, DURGÁ, flanked by LACSHMI and SARASWATI; five of these figures are crowned with a sort of tri-pointed diadem, while the sixth has a round turban or cap. One of the forms of DURGA' has the right foot on the head of the demon, while the left is twisted up at her side, and the hands are clapsed over the breast, in the attitude of supplication; under the central groupe of the whole, and forming part of what may have been intended for the ornamented frieze of the temple, is a seated figure of GANESH in relief, five inches high, flanked by two other persons, one of them playing on a stringed instrument, and the other wielding a club. The lower part and sides of the block are decorated with a band of carving, showing beasts of different kinds, encircled by wreaths of flowers, in relief, and the gods are placed in scalloped arches, supported by pillars, which divide each of the images from its neighbour.

The priests are so little versed in the distinguishing characteristics of the Hindu deities, that they could not determine whom the figures were intended to represent.

Near the images are nine square pedestals of large dimensions, with three carved feet, which must have been intended to give support to as many columns: of these, several have almost disappeared in the earth; and it is likely, others are lost altogether. It shows at all events the design of the temple must have been projected on a large scale. These pedestals do not appear to have been moved from the spot where they were originally carved, and they are so little impaired by time and exposure to the elements, that I feel assured they are of modern date, compared with the buildings in the plantation and on the adjacent plains; they were, indeed, as fresh to look at as if but recently executed by the mason's chisel. Vast fragments of the epistylium and frieze, carved with beaded drapery, also lie half buried in the soil. The people at one time commenced fracturing the stones, from an idea that gold was concealed in their cavities, but desisted, on a mysterious warning of the goddess DURGA', who threatened to visit such sacrilegious attempts with death.

In the south-west angle of the Poṛá plains, there is another curious remnant of sculpture, also wrought from a single mass of granite, upwards of ten feet long, and two and a half feet thick at the middle; it appears to have formed the side of a gate, and has a band of carving three inches broad on each side, showing in relief elephants, tigers, deer, rams, cattle, and swans, encircled by scrolls of flowers. The stone has in all twenty-five figures of Hindu deities, disposed

cross-wise upon it; of these, the eighteen upper ones are in six rows, three of a row, and each in a separate compartment, while the centre figure is much more elevated than its fellows: they represent male and female divinities, twenty inches high; among them I recognized Hanumán. Another image has a fish's tail, and represents, I think, the Máchh Avatár or first incarnation of VISHNU, who is recorded to have appeared in the form of a fish to SATYAVRUTA, to warn him of the great flood. Several other figures are playing on stringed instruments, and the three lower ones are merely busts, with hands clapsed over the breast. The lowest compartment embraces three images, of whom SIVA occupies the middle place, and is provided with a venerable flowing beard; he stands thirty inches high, and on each side of him are females, twenty-six inches high: one has been destroyed, but the other is playing on a stringed instrument, and her ears are strung with a pair of enormous circular rings. Over this compartment are two groups of dwarf figures, six inches high, in a sedentary posture, and the whole sculpture bears evident marks of having been mutilated by a barbarian hand.

No quarries were discovered, to indicate that the stones were disembowelled from the hills; but quantities of chips were seen in places: and once I came upon pillars and altars in an unfinished state, shaped from blocks of granite, on the surface of the earth; and there seems no question that all the material employed on the fabrics was similarly procured from the masses of rock that cover the hills in great abundance. Once or twice only I fell in with well-burnt bricks; they were smooth and thin, of rather a large size, but not badly shaped. Great part of these extensive ruins are buried or have sunk into the earth, and they cover altogether four or five acres of land. I have been thus particular in noticing them, because there are not, so far as I know, any architectural remains in Assam, that can challenge a comparison with them for durability of material and magnitude of design; and it is certain, from the prodigious number of ruinous and deserted temples, all of which appear to have been dedicated to SIVA, being within the circuit of a few miles of Poŕá (I discovered twelve or fifteen in as many days on the hills and highlands at their feet), that this spot must have been the capital of a sovereign Prince, or a principal seat of the Hindu religion, and enjoyed a large share of prosperity at some remote period*.

* The records of Assam, which I consulted, mention, that CHU CHENG PHA', the seventeenth sovereign of the Ahom dynasty, in a direct descent from CHU KA PHA', the conqueror and founder of the kingdom, being stung with remorse for the

II.—*Remarks on an Inscription in the Ranjá and Tibetan (Uchhén) Characters, taken from a Temple on the Confines of the Valley of Nepál. By* B. H. HODGSON, *Esq. Resident.*

On the main road from the valley of Nepal to Tibet, by the Eastern or Kúti Pass of the Hemáchal, and about two miles beyond the ridge of hills environing the valley, there stands a diminutive stone *chaitya*, supported, as usual, by a wide, graduated, basement.

Upon the outer surface of the retaining walls of this basement are inscribed a variety of texts from the Bauddha Scriptures, and amongst others, the celebrated Shad-Akshari Mantra, *Om Mani Padme Hom.* This is an invocation of PADMÁ PÁNI, the 4th Dhyáni Bodhisatwa, and præsens Divus of the Theistic school of Buddhists—with an accessary mention of their triad, under that symbolic, literal form which is common to them and to the Brahmanists*. It is not, however, my present purpose to dwell upon the real and full import of these words; but to exhibit the inscription itself, as an interesting specimen of the practical conjunction of those two varieties of the Devanágari letters which may be said to belong respectively and appropriately to the Saugatas of Nepál and of Tibet. Not that *both* forms have not been long familiar to the Tibetans, but that they still consider, and call, that one *foreign* and *Indian* which the Nipálese Bauddha Scriptures exhibit as the ordinary ecriture; and which, though allowed by the Nipalese to be Indian, and though most certainly deduceable from the Devanágari standard, is not now, nor has been for ages, extant in any part of India.

cold-blooded executions which he caused to be done upon many innocent persons, erected a temple to MAHESWAR (SIVA), and first established Hinduism as the religion of the realm. According to one author, CHU CHENG PHA' ascended the throne in the year of Sakádityá 1524 (A. D. 1602), while another author places the occurrence fourteen years later. He died A. S. 1563, (A. D. 1641.)

I think Dr. BUCHANAN must have been wrongly informed, when he asserts the conversion of the royal family to the new faith was effected in the reign of GADADHAR SINGH, who he calls the fourteenth prince of the family; while I make him out to be the twenty-ninth in succession to CHU KA PHA'; he was however the first Ahom sovereign who took the Hindu title, which may have led the Dr. to credit the information communicated to him.

The proper name of the king GADA'DHAR SINGH was CHU PAT PHA', and he reigned from A. S. 1603 to 1617, (A. D. 1681 to 1695.) In A. D. 1692-3, he dispossessed all the Bhukuts of their possessions, and compelled them to reside together in Kámrup, in Upper Assam; and in the year following, he cast all the images of the votaries of VISHNU into the Bruhmaputra.

* Viz. the triliteral syllable Om, composed of the letters A, U, and M, typifing, with the Brahmanists, Brahmá, Vishnu, and Mahesá—but with the Buddhists, Buddha, Dharmá, and Sanga.

Inscription on a Chaitya at Dánra gaón, 15 Miles E. of Kathmandu.

Tibetan characters

Ranja characters

C.R. Traill lith.

It is peculiarly Nipálese; and all the old Sanscrit works of the Bauddhas of Nepál are written in this character, or, in the cognate style denominated Bhujin Múlá—which latter, however, I do but incidentally name. I wish here to draw attention to the fact that that form of writing or system of letters called Lantza in Tibet, and there considered foreign and Indian, though no where extant in the plains of India, is the *common vehicle of the Sanscrit language amongst the Bauddhas of Nepál proper*, by whom it is denominated Ranjá, and written thus, in Devanágari रंजा; *Ranjá* therefore, and not according to a barbarian metamorphosis *Lantza*, it *should* be called by us; and, by way of further and clearer distinction, the Nipálese variety of Devanágari. Obviously deduceable as this form is, from the Indian standard, and still enshrined as it is in numerous *Sanscrit* works, it is an interesting circumstance to observe it, in *practical collocation* with the ordinary Tibetan form—likewise, undoubtedly Indian, but far less easily traceable to its source in the Devanágari alphabet, and devoted to the expression of a language *radically different from Sanscrit*. Nor when it is considered that Ranjá is the common extant vehicle of those original Sanscrit works of which the Tibetan books are translations, will the interest of an inscription, traced *on one slab in both characters*, be denied to be considerable. Singular indications, indeed, are these of that gradual process of transplantation, whereby a large portion of Indian literature was naturalized beyond the Himálaya, as well as of the gradual eradication of that literature from the soil of its birth, where, for four centuries probably, the *very memory of it* has passed away*! Those who are engaged at present in decyphering ancient inscriptions would do well, I conceive, to essay the tracing, through Ranjá and Bhujin Múlá†, of the transmutation of Devanágari into the Tibetan alphabet. In conclusion, I may observe, that this habit of promulgating the *mantras* of their faith, by inscriptions patent on the face of religious edifices, is peculiar to the Tibetan Buddhists, those of Nepál considering it a high crime thus to subject them to vulgar, and perchance uninitiated utterance.

The Tibetan sentiment and practice are, in *this* respect, both the more orthodox and the more rational. But in another important respect, the Nipálese followers of Buddha are far more rational at least, if far less orthodox, than their neighbours: for they have utterly rejected that absurd and mischievous adherence to religious mendicancy and monachism which still distinguishes the Tibetans‡.

* The very names of the numerous Sanscrit Bauddha works recently discovered in Nepál were totally unknown to the Pandits of the plains, who received the announcement of the discovery with absolute disbelief.

† All the four systems of letters are given in the 16th vol. of the As. Researches.

‡ The curious may like to know that Tibetan Buddhism is distinguished from

I need hardly add, after what has been just stated, that the circumstance of the inscriptions being *mantras* proves the temple or *chaitya*, adverted to, to be the work of Tibetans, though existing on the very confines of Nepál proper—a fact indeed which, on the spot, wants no *such* confirmation. It is notorious; and is referrible to times when Tibetan influence was predominant on this side of the Himálaya. The great temple of *Khása chit*, standing in the midst of the valley of Nepál, is still exclusively appropriated by the Trans-Himálayans.

Note.—So much has been published on the subject of the mystical *mantra* above alluded to, that it is unnecessary to do more than direct the attention of the reader to the learned dissertation by GEORGI in the Alphabetum Tibetanum, page 500, &c. and to a more recent elucidation of the same subject in KLAPROTH's Fragmens Bouddhiques in the Journ. Asiatique, Mars, 1831, p. 27.—The *mantra* is quite unknown to the Buddhists of Ceylon and the Eastern Peninsula, and it forms a peculiar feature of the Tibetan Buddhism, shewing its adoption of much of the Brahmanical mystic philosophy. A wooden block, cut in Tibet for printing the very passage in the two characters, and from its appearance of some antiquity, is deposited in the museum of the Asiatic Society.—ED.

Note.—M. KLAPROTH, in his memoir in the Nouveau Journal Asiatique, where he has brought so much of the erudition of Eastern and Central Asia to bear upon this Buddhist formulary, attaches himself to two versions principally, as preferable to all that he finds elsewhere among Tibetans, Mongolians, and Chinese. The former is, "Oh precieux Lotus! Amen," on the supposition of ओं मणिपद्म हूं being the true reading; but if it be read, as he justly prefers, ओं मणिपद्मे हूं, "Oh! le joyau est dans le Lotus. Amen."

There is no objection to the former translation, that of "*Om mani-padma húm:*" for the two nouns cannot be read as *separate* vocatives, "Oh jewel! Oh Lotus!" (as M. CSOMA DE KÖRÖS informs us it is understood in Tibet,) without reading *mané* मणे instead of मणि.

The latter translation of "*Om mani padmé húm*" is not equally admissible: for it would require indispensably by grammatical rule, either the insertion of a Visarga after *mani*, or the substitution of a long *i* for the short one, so distinctly marked in the inscription; i. e. the nominative मणिः or मणी instead of the crude form मणि. The junction of the two nouns in one compound is therefore as necessary in the reading of the locative case, as in that of the vocative; and this makes it necessary to translate it thus: "AUM (i. e. the mystic triform divinity) is in the jewel-like Lotus. Amen." The legends cited by M. KLAPROTH respecting BUDDHA apply as well to this version of the formulary as to his. I hope that Mr. HODGSON may hereafter favour us with the import of these words, as explained in the yet unexplored treasures of *Sanscrit* Buddhist literature in Nepál." W. H. M.

Nipálese, *solely* by the two features above pointed out—unless we must add a qualified subjection on the part of the Saugatás of Nepál to caste, from which the Tibetans are free; but which in Nepál is a merely popular usage, stript of the sanction of religion, and altogether a very different thing from caste, properly so called.

III.—*Journal of a Tour through the Island of Rambree, (Rámrí; Sans. Rámávati,) on the Arracan Coast. By Lieut.* William Foley.

[Continued from page 95.]

The town of Rambree*, with its meandering creek, fine wooden bridges, and the handsome temples that surround it, is perhaps the prettiest spot upon the island; and from no place is it seen to such advantage as from the hill of *Koyandoung*. The creek is not very broad, but it contains sufficient water to admit of the approach of large boats to the market place—a matter of some importance in a country where land carriage is not to be obtained; or if procurable, would scarcely be available, from the absence of good roads, bridges, and ferries, throughout the island. The town is divided into the following compartments; viz. *Oung-tshiet*, *Shuwe-dong*, *Wedt-chu*, *Tath-tweng*, and *Taing-kuman*. The former commemorates the landing of the first Burmah chieftain at the ghaut of *Rambree*, when the island was first annexed to the dominions of Ava. In *Shuwe-dong*, a large pole, covered at the top with gold, was erected; and in its immediate vicinity, stood a house in which the conjurors† used to dance, invoking the aid of their favourite idol on the occasion of any calamity. *Wedt-chu* was so called from the great assemblage of pigs in that quarter. *Tath-tweng* was the site of the Burmah stockade, and now the locality of the Government jail, formed chiefly from the materials of that stockade. *Taing-kuman* is the place occupied by the *Kuman-thsí*, a class that shall be more particularly noticed hereafter. It is gene-

* Also called "*Táing*," or "*Yáing-Ruah*" by the Mughs; the provinces *Rambree*, *Maong*, and *Thandowey* having suffered considerably from the incursions of the Burmahs and Thaliens during the year 791 M. S. the *Rájá* Choumoeng, on his restoration to the throne of *Rukkhein-preh* (Arracan), adopted such means as were likely to restore them to their former flourishing condition; and for that purpose, deputed his minister Anunda'-Suya'h to proceed to those provinces, taking with him such Burmah or Thalien agriculturists and artisans as had been able to quit the country. Anunda'-Suya'h, in the first place, visited *Rambree* Island, forming colonies, and giving names to the several new settlements, according to the various ominous appearances that presented themselves. It is said, that during the night his vessel lay at anchor in the *Rambree Creek*, a voice was heard to exclaim,

"*Thán-lo!*" "*Thán-lo!*" Stop! Stop! a favourable omen, inducing a further stay at the place, and the foundation of a town that received the name of "*Táing*" or "*Táing-Ruah*."

† A set of vagabonds, receiving little countenance from the people at large. A man, attired in woman's apparel, connects himself with another of the profession, whom he calls his husband, and obtains for this husband a woman as his second wife, with whom both cohabit; every respectable native looks upon this class with disgust and horror.

rally admitted that the town has increased in size (though perhaps not in wealth) since it fell into the hands of the British; but this augmentation has been slow, and by no means equal to the expectations that might have been indulged on the change of rule. It would be foreign to the purpose of this brief sketch of *Rambree* to enter into a detail of those causes that seem to obstruct the accumulation of capital; but this much may be said, that the multiplication of taxes, by the intricate division of trades, and the vexatious nature of many of these taxes, is one grand check to the industry of the population; and from thence it is easy to deduce its consequences, as they may affect the revenue, or the morals of the people.

The whole of those improvements which have been made in the town of late years, and contribute so much to the comfort and convenience of the inhabitants, it owes to the taste and liberality of the magistrate* (now residing there), who has devoted large sums of money from his private purse towards the erection of bridges, market stalls, and other public buildings.

Noticing each class under a separate head, with the distinction of sexes, the number of souls residing in *Rambree town* will be as much as follows:

	Adult males.	Adult females.	Boys.	Girls.	Total of each.
Mughs, ...	1549	1637	1393	1224	5803
Burmahs, ...	554	473	359	375	1761
Kuman-thsí, ...	407	383	324	323	1437
				Grand total of souls,	9001

In addition to the above there are a few Musalmans and Hindus; but their number is comparatively small, and their residence in the town (especially of the latter), attended with so much uncertainty, that I have not thought it necessary to include them in the *census*. The Musalmans were either (originally) adventurers from Cathaí and Ava, or owe their extraction to the Musalmans of Bengal, who fell into the hands of the *Rukkhein* marauders in earlier times, and were taken prisoners during the wars of the *Rukkhein preh*† Rájás with the Nawábs of

* Captain WILLIAMS, 45th Regt. B. N. I.

† Arracan, known in past times as *Rekhá-pura;* and so called from its having been the abode of the "*Rakkhus;*" a fabulous monster, said to devour the inhabitants. The scene of this monster's alleged depredations seems to have been in the neighbourhood of what is now termed the "Fort of Arracan!" (*Mrou-u-mu,* built by Rájá CHOUMOENG, in the year of GAUTAMA 1150, and in the common era 792, or A. D. 1430.) On the extirpation of this monster, Arracan was termed "*Rukkhein-preh,*" or "*Rukkhein-táing,*" the country of the *Rukkheins;* an appellation equally common to the natives of Arracan with that of *Mugh,* or *Mogh:* the Burmahs substituting the letter *Y,* for *R,* call them "*Yukkhein.*"

Chittagong and Dacca. They are now so assimilated to the rest of the population in dress, language, and feature, that it is difficult to conceive a distinction ever existed. As if ashamed of their Muhammedan descent, individuals of this class have generally two names, one that they derive from birth, and the other such as is common to the natives of Arracan, and by which they are desirous of being known. The Hindus, again, are generally natives of Chittagong and Dacca, who came down into Arracan to pick up what they can, returning to their homes so soon as a certain sum of money shall have been collected.

Under the head of Mughs *(Magas)* are included many inferior castes, such as the *Hyáh*, *Phrá-gyoung*, and *Dhúng*. Much uncertainty prevails with respect to the origin of these castes; it is either involved in obscurity, or totally lost to those with whom I have conversed upon the subject. By some, it is affirmed, that the *Hyáhs* were originally natives of a country beyond *Manipur*, but nothing further could be obtained, so as to facilitate a discovery of their descent, or account for their settlement in the province. In former days, the *Hyáhs* tilled the crown lands, were exempted from taxation, and gave one-half of the produce to the sovereign. It is insinuated by the *Rakkheins*, that not a few of the *Hyáh* caste were employed as eunuchs in the service of the Arracan Rájas. They now occupy themselves in the cultivation of *pawn* and *chilly* gardens, but are looked upon as an inferior caste, and consequently never intermarry with the *Rakkheins*.

The caste termed *Phrá-gyoung* now no longer abound in Arracan, or are so concealed, that it would be difficult to point out one particular person to whom this term can be properly applied. In Ava this class is still very numerous, more especially in the neighbourhood of the most celebrated temples* and *Kioums*; it being the duty of the *Phrá-gyoungs* to perform the several servile offices required, such as sweeping the sanctuary, lighting the fires, and spreading the mats in the monasteries. As a reward for these services, they are permitted to remove, for their own consumption, the fruits, grain, &c. that may be offered up to the *Phrá*. The *Phrá-gyoungs* are said to have sprung from those who, in a distant period, had been convicted of some offence, and were made slaves for the service of the temples as a punishment for the same.

The *Dúngs* are believed to be of *Hindu* extraction; their appellation so like to that of the *Dhúms* of India would seem to corroborate

* Such as *Shuwe-Zettan* and *Shuwe-dag-gone*.

this statement; and it must be further remarked, that their occupation in former days is said to have resembled that now allotted to their namesakes in Bengál. The *Dhúngs* of Arracan will not, however, so employ themselves at the present day; endeavouring to conceal their true descent, they are generally rope-makers and fishermen.

Burmahs of pure extraction are rare in *Rambree;* those that retain the name are of mixed blood, and properly termed "*Bundáth.*" They are the descendants of those *Burmahs* who accompanied the several *Mey-o-wúns* to the province; uniting themselves with the Mugh women, and remaining in *Rambree* with their families on its being given over to the British.

The class of Musalmans termed *Kuman-thsí** are particularly deserving of notice. There is little doubt but this interesting people owe their descent to that devoted band of warriors which accompanied the unfortunate SHA'H SUJA'H into Arracan. As is well known, both the SHA'H and his followers, (who were numerous) met at first with a friendly reception from *Meng-ka-mong*†, the Rájá of *Rakkhein-preh.* But the repeated representations of the cold-hearted AURANGZEB induced the wretch to adopt another line of conduct; the SHA'H and his troops were several times attacked, and finally defeated. The prince was put to death, and such of his followers as survived the slaughter were made prisoners, and eventually distributed in different parts of the kingdom. Lands and implements of husdandry were assigned to them, and they were further encouraged to marry with the women of the country. Many availed themselves of this permission, and their wives did not object to embrace the faith of Islám. There is a curious circumstance connected with the distribution and final settlement of the *Kuman-thsí* in the province. When brought to the presence of *Meng-ka-mong,* and asked what profession they were individually desirous of adopting, a few who were unable to speak the language of the country, put their hands up to their heads, and pointing out the two fore-fingers, endeavoured to represent an animal with horns; thereby intimating that they wished to follow the occupation of herdsmen. Upon this the Rájá directed a supply of cattle and goats to be given to them, and those who received the latter were placed upon a small island that has since been termed *Tchye-kî-ún*‡ (Goat Island). In the time of the Arracan Rájás,

* Kamandar? Bowman? (*Kamánchi* more probably.—ED.)

† I feel a pleasure in giving the name of this individual, in the hope that it may tend to perpetuate his infamy.

‡ Called "*Saddle Island*" by the British.

and even so late as during the Burmah tenure of the country, the *Kuman-thsís* invariably attended the prince royal, or governors on their journey through the several provinces of the empire; preceding them upon the road, and bearing their bows and arrows in their hands. These implements of war are now laid aside, and the *Kuman-thsí* are, in common with others, occupied in such pursuits as are more congenial to the age; being for the most part weavers and dyers, and residing in a separate quarter of the town, the avowed adherents to the Muhammedan faith, but ignorant of the precepts it inculcates, and assimilating in practice to the rest of the population. Seven generations* are said to have passed away since the event above described; yet notwithstanding this lapse of time, and in spite of the similarity of language and attire, the features of the *Kuman-thsí* still betray their superior descent; while for beauty of stature, and agility of limb, they surpass the Muhammedans of India.

With the view of so many houses, and such a population as that contained in *Rambree*, together with the fact of its being the *second city in Arracan*, it is surprising to witness such apparent poverty in the show of empty shops on each side of the street. Here and there a Manchester shawl, a piece of chintz, or printed handkerchief might be seen hung up to view, surrounded with the more homely productions of the country; but the largest and best supplied shop of *Rambree* would scarcely be deemed worthy of notice in any one of the *sudar bazárs* of India. Few engaging in trade: the greater part of the population are either idlers, day-labourers, agriculturists, or fishermen, (as circumstances may induce,) having no regular occupation calling for the exercise of a dexterous and *continued* application. It is difficult to ascertain with precision the period of the greatest known prosperity in the town of *Rambree*. Different accounts are given by different people, according to their views, or the ideas they may entertain. Those who admit the population and wealth of *Rambree* to have been greater than they are at present, fix the date of such alleged prosperity during the administration of the Burmah *Mey-o-wun, Keodine-Yájah* (A. D. 1805). At that time *Rambree* was the grand emporium of trade; so many as 60 large *godahs* were known to enter the creek from different parts of Bengal, and proceed from thence to Rangoon and Tavoy, receiving at *Rambree* rowannahs spe-

* By Dow's account, it is 170 years ago. I must notice an error that the historian of India has fallen into; there is no river running from any part of Arracan into *Pegu*; the native name for Arracan proper is "*Peygrí*" or "*Peygí*," (signifying a large country,) and this word has been evidently confounded with *Pegu*.

cifying the duties they had paid, to secure them from further taxation on their arrival at any intermediate Burmah port. The town of *Rambree*, and indeed the whole island, suffered much in later years in consequence of the insurrection of the *Mughs*, excited by the Ramu Rája KIMBRANG, and only subdued by the energetic conduct of NEMYO-SUYA'H*, the Burmah chief to whom the *Mey-o-wun* SAOTI'JA'H had entrusted the defence. This rebellion was followed by a species of retaliation that deprived the town of *Rambree* of nearly the whole of its *Mugh* population. All the *súgris*, merchants, and others suspected of having conspired against the government were put to death, or obliged to fly the country.

It was the invariable, and, in some instances, necessary policy of the Burmese to trust as little as possible to the good will of the conquered. Securing their position by a strong stockade, and separating themselves from the inhabitants, they formed a little garrison of their own in *Rambree*; within this stockade all affairs both civil and military were transacted. The Burmah *Mey-o-wuns* were not, however, inattentive to the comfort of the people, or the embellishment of the town: the large tanks, *Kus*, and *Kioums* now seen at *Rambree*, were either constructed by the *Mey-o-wuns*, or by those who held situations of emolument, under them. Some of these temples are still existing, unscathed by the hand of man or the less hostile elements. Others, again, have crumbled into dust, the remains of those stupendous monuments that have marked the propagation of the Buddhist creed in the most distant parts of the world. Internally they are filled up with earth, the wall being of brick, well cemented together. Relics of GAUTAMA, such as the hair, feathers, bones, &c. of the several creatures whose form he assumed previous to his becoming man, with gold and silver images, dishes, goblets, and other utensils, are deposited in the interior: a certain portion of each placed in the upper, middle, and lower part of the temple. The *Kioums* at *Rambree* town are, as might be expected, larger than those commonly met with on the island. One of these attracts attention from its superior size, and the elegance of its construction. It was built by a native of *Rambree*, named KOMENG-SHUWE-BO, who had been dewán to the Burmah *Mey-o-wun* SAOTI'JA'H, and was one of those to whom suspicion of conspiracy was attached, but saved from death at the intercession of the *Chilkí*† MOUNG-BO. KOMENG-SHUWE-BO was in later years exalted to the office of *Mey-o-wun* over the island‡ circles, the Burmah *Mey-o-*

* Afterwards *Mey-o-wún* at *Rambree*.

† The name for the Burmah *Superintendent of Police*.

‡ *Mrukyoung, Murajyne, Kweyne-Kyoung, Kyoung-saa-yah, Koukoh, and Múe-du-in-du.*

wún SHUWE-DONG-SA-GA-SU residing at *Rambree*. The latter was subsequently sent on a mission to Benares, and his brother *Mounge* appointed to officiate during his absence. The mission was directed to ascertain the existence of the *Bhodibeng* tree, as well as the site of many places known to have been the scene of GAUTAMA's early labour. On the return of SHUWE-DONG-SU-GA-SU to the court of Ava, with the information obtained, he took the opportunity of effecting by the most *persuasive* means the dismissal of his rival from office, and from his unremitting but futile endeavours to regain that place by a method equally expensive, KOMENG-SHUWE-BO is now living in comparatively reduced circumstances at the town of *Rambree*.

The change of rule has perhaps been as fatal to the prosperity of the monastic sects, as it has been disadvantageous to those who once constituted the higher classes of the people. The influence voluntarily conceded to the *Phúngrís* by the Burmah *Mey-o-wúns* was astonishingly great, and reminds one much of the power once possessed by the priesthood of the Catholic kingdoms in Europe. In cases where a more peaceable species of intervention had proved unsuccessful, it was not uncommon for the *Phúngrís* to assemble for the rescue of a criminal about to suffer execution. The spot selected for the process of decapitation was in the neighbourhood of a large tree, at the S. E. extremity of the town. The unfortunate criminal, having been previously manacled, was led out for execution between files of Burmah soldiers, and when arrived at the ground was made to kneel with the head inclined, as a mark of obeisance to the ruler of the land, and avowal of the justice of the sentence. In the meantime, the head was severed from the body (generally with a single blow of the dao) by the executioner*, who stood behind waiting the signal for the stroke. It being deemed a crime to take away life, it is conceived, by the worshippers of BUDDHA, an act of piety to endeavour to save from death even the vilest of animated beings; and as little resistance was evinced towards a class held in such peculiar veneration, the *Phúngrís* not unfrequently succeeded in carying off the criminal before execution had been effected. Taking him to the *Kioum*, he remained there until death or a change of Government secured him from the malice of his enemies, and the vengeance of the law in punishment of his crimes.

* The *executioners* were individuals who had been condemned to death for heinous offences, and subsequently spared, on condition of their devoting their lives to the performance of this odious service. They were at the same time branded upon the cheek to guard against the chances of desertion.

At some little distance below the town, and on the right bank of the creek, is a small village, inhabited by that extraordinary race the *Kaengs*, of whose origin still less seems to be known than what has been imperfectly detailed of other castes. The *Kaengs of Rambree*, by their own account, came down many years ago from the mountainous regions of *Kaladong* and *Kyen-duing-myít*, in Arracan proper; and as they can give no information whatever respecting their first settlement in those places, it is possible that they may be the *aborigines* of the country. Divided into *clans*, and differing from both Mughs and Burmahs in feature as well as attire, the *Kaengs* have many peculiar customs of their own, some of which deserve to be noticed. When any one of a clan dies, the body is laid upon a funeral pile, and consumed: the ashes, carefully collected within an earthen vessel, are conveyed to the mountain from whence the clan was known to have originally come, and there deposited in the earth. There is something awfully grand in this manner of disposing of their dead, bespeaking the existence of that love of liberty and of country still engrafted in their souls, which had in some instances rendered them* secure from their enemies. That same spirit of Freedom dictated an observance† which, however revolting it may appear to European ideas, cannot fail to attract the admiration due to a virtuous feeling, that deems honor and reputation of more account than beauty, and has induced the father of a family to disfigure the faces of his daughters the more effectually to preserve them from the contamination of strangers. The mode of performing the operation is as follows: The young maiden is enveloped in a mat, and forcibly held down to the ground, while gun-powder or indigo is rapidly pricked into the skin (over the whole of her face) by means of a pointed instrument. This is generally done at an early age, and the pain produced by it ceases after the lapse of three or four days. So soon as released from the hands of her tormentors, the poor girl is presented to the dogs of the village, and should they evince any signs of anger or surprise, the operation is deemed to have been effectually performed. The *Kaengs* are not very numerous in Arracan, being found more plentifully distributed along the *Yúmadong*, and the less elevated mountains in their

* The *Kaengs* of Arracan were on some occasions particularly troublesome to the Burmese invaders, who feared to follow them to their mountain fastnesses.

† The *Kaeng* women are generally very handsome, and the Burmahs, as well as their predecessors, several times attempted to possess themselves of their persons: it was with the view of saving their daughters from such degradation that the *Kaengs* instituted the observance here described.

neighbourhood. Residing in the thickest part of the forest, and superior to the *Rakkheins* in hardiness of constitution, as well as bravery of soul, they are chiefly occupied in the pursuit of game, or in the collection of honey, wax, elephants' teeth, and such other forest produce as may meet with a ready sale in the plains. The *Kaengs* of *Rambree* are for the most part engaged in the cultivation of vegetables, and the manufacture of spirituous liquors, which are in general demand with those of their own class, forming an essential ingredient on all occasions of festivity, whether in the celebration of a marriage, or in the more important ceremonies of a funeral. Indifferent to the nature and quality of their food, they not only subsist on vegetables and grain, but eat the flesh of most animals—a preference being given to that of dogs and swine.

The *Kaengs* possess no written records whatever of their descent; and as they can neither read nor write, deeming it superfluous to instruct their children in such matters, it is not susprising that all traces of their origin should be either lost, or enveloped in total obscurity at the present time.

IV.—*On the amount of Rain-fall at Calcutta, as affected by the Declination of the Moon. By the Rev.* R. Everest.

Since my last paper upon this subject I have been enabled to compare the meteorological registers with the Nautical Almanacks. In doing this I have made out a table of the average daily quantity of rain that fell in each rainy season with every $2\frac{1}{2}$ degrees of the moon's declination. I have now the honour to lay it before the Society, and to add, that where the registers were complete, I have begun the average with the first rain that fell in April, and ended it with the last that fell in October.

Average Quantity of Rain in decimals of Inches in the years

Moon's declination.	1823	1824 and 1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	Gen. mean.
2°30′	·231	·000	·353	1·187	·152	·288	·320	·365	·189	·364	·345	·345
5°00	·110	·002	·831	·230	·180	·369	·660	·076	·223	·175	·412	·297
7°30′	·167	·000	·080	·586	·440	·449	·126	·119	·249	·316	·329	·260
10°	·315	·016	·164	·077	·229	·436	·350	·434	·332	·373	·370	·281
12°30′	·142	·153	·688	·078	·252	·373	·267	·141	·132	·079	·237	·231
15°0′	·483	·001	·340	·315	·502	·227	·230	·319	·144	·285	·249	·281
17°30′	·133	·152	·211	·205	·223	·317	·419	·409	·134	·269	·186	·242
20°0′	·196	·036	·305	·261	·632	·251	·234	·311	·180	·386	·253	·277
22°30′	·052	·096	·231						·332	·277	·282	·211
25°	·721	·158								·622	·432	·483
27°30′	1·580											1·580

Note.—The periods for which these averages were taken, are for 1823, the months of August and September; for 1824 and 1825, Nov. Dec. Feb. and March; for 1826, May, June, July, August, Sept. Oct.; for 1828, July, Aug. Sept. and Oct.; for the other years, from the first rain in April to the last in October.

It will be observed that the numbers in the General Mean (the last column) are somewhat irregular, which I apprehend is owing to the series of years being too short for the subdivision I have adopted, viz. 2°.30′, if instead of that we take 5° as the subdivision, the numbers come out regularly, as follows:

Moon's declination.	*General Average of Rain-fall.*
5 degrees.	·321 inch.
10 do.	·271
15 do.	·256
20 do.	·259
25 do.	.347

The results are somewhat different from what I expected, for they shew an increase of rain, not only towards the maximum, but towards the minimum declination of the moon. Had it been towards the maximum only, we might have accounted for it by supposing the rain to vary with the principal tide, either superior, or inferior; and had it been towards the minimum only, we might have supposed that the rain was the effect of the mean tide, as in all latitudes, less than 45°, the mean tide increases as the declination of the moon diminishes. However, when our data are more perfect, we may be able to get an explanation of the phenomena. In the meanwhile, lest any one should object that the series of years for which the average has been taken, is too short to establish the fact of an increase towards the maximum declination, I beg now to offer some other reasons which led me to the conclusion before I obtained a sight of the Almanacks.

I must first remind you that, owing to the revolution of the nodes of the moon, her maximum monthly declination decreases for a series of years, and then increases. Thus if we turn to the Table, we find that in the year 1829, and for two years both before and after it, the maximum declination was always less than 20°. This revolution of the nodes is completed in a period of about $18\frac{2}{3}$ years, or more correctly, 6803 days, 2 hours, 55 minutes. Now then, supposing it to be true that the rain-falls vary with the declination of the moon; in those years in which the declination is small the rains ought to be scanty, and *vice versâ* to increase as the former increases. We have no register of rain for a long series of years, but we have a valuable record left us for the illustration of this part of our subject, similar to that register of the height of the annual inundations of the Nile, which the ancient Egyptians measured by means of a Νειλοσκοπειον, or Nilometer, placed on the bank of the river; I allude of course to Mr. Kyd's Register of the height of the Hooghly in different years*. In the map No. 4,

* See his paper on the subject, (Part 1. Trans. Phys. Class, As. Soc.) and the map which accompanies it.

subject, (Part 1. Trans. Phys. Class, As. Soc.) and map to accompany it. In the map No. 4, we have the line of the highest high water, and of highest low water in the different years, and I have transferred those heights into numbers (as nearly as could be done by common measurement), and then taken the mean of both for the mean height of the river in each year during the rainy season. Recollecting then, that the monthly maximum declination of the moon was at its least about Michaelmas 1829, its greatest would be about the end of May, 1820, and its least again, very early in 1811:—and regarding the Hooghly as the general rain gauge of the country*, we have the mean height of the river in each season, as follows:—

1806. ft. in.	1807.	1808.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.
15 10	15 11	15 0	15 6	14 4	15 0 min. dec.	14 10	13 10 *	14 9	15 4	14 1
1817. ft. in.	**1818.**	**1819.**	**1820.**	**1821.**	**1822.**	**1823.**	**1824.**	**1825.**	**1826.**	**1827**
15 5	16 4	15 8	15 9 max. declin. of ☽.	15 9	16 7	19 3 *	15 10	15 5	15 10	15 0

There is an irregularity in these numbers; and both the minimum and maximum height of the river appear to have occurred from two to three years after the maximum declination of the moon; but if we take the average of five or seven years nearest the maximum, and compare it with the average of a similar number of years nearest the minimum, the difference will be striking. A curious question here arises—Have we in history any record of inundations, or drought and famine corresponding in the times of their occurrence with these different positions of the moon? I think we have. But the question is one that demands a very wide research, much more so than, with my present limited means of reference, I am able to give it; but I hope at a future time to be able to lay a few items of information respecting it before the Society. In my last paper, I suggested that the great abundance of rain when the moon's declination was greater than 22°30′ might be accounted for by the locality of Calcutta, but on consulting my own register, I find that a similar effect was perceptible at Dehli (lat 28°40′) last year. As a sample of it, I subjoin the days in the month of July on which rain fell, with the amount, and declination of the moon at noon.

* It must be remembered that the level of the Hooghly at Calcutta is also affected materially by the tides of the Bay and by the prevailing winds of the season.—Ed.

1824.	*Inches Rain-fall.*	*Moon's declination.* ° ′
July 3,	3·49	17 54 n.
—— 4,	1·58	21 6
—— 5,	0·07	23 18
—— 6,	0·34	24 16
—— 7,	2·01	23 49
—— 8,	0·50	21 55
—— 13,	0·08	2 24 s.
—— 14,	0·56	8 5
—— 15,	2·16	13 19
July 16,	0·48	17 48
—— 19,	2·66	24 18
—— 20,	0·35	23 44
—— 21,	2·70	21 54
—— 22,	3·78	19 1
—— 23,	1·18	15 18
—— 29,	0·11	12 35 n.
—— 30,	0·50	16 39
—— 31,	0·90	20 6

I have not yet had leisure to compare the barometric and other indications with the moon's declination, but I shortly intend to do so. From present appearances I cannot help feeling sanguine that the moon's declination will be found to be the principal cause of the different atmospheric variations, exclusive, of course, of those which are occasioned by the regular annual progress of the sun. However, whether there be any thing of truth in these inferences, or whether I have been misled by a series of chance co-incidences, time only can determine. If those inferences are well founded, the years of drought are past, and the years of plenteous rain approaching. By this test let them be tried, for no one can desire a fairer.

1835.	*Moon's Dec.*
June 1,	23°11′n.
—— 2,	20 1
—— 5,	4 56 n.
—— 6,	1 12 s.
—— 9,	18 39
—— 10,	22 24
—— 11,	25 10
—— 12,	25 50
—— 13,	24 44
—— 14,	22 7
—— 15,	18 21
—— 18,	33 5 s.
—— 19,	13 9 n.
—— 23,	19 53 n.
—— 24,	22 54
—— 25,	24 56
—— 26,	25 48
—— 27,	25 24
—— 28,	23 42
—— 29,	20 41
July 3,	0 23 n.
—— 7,	21 20 s.
—— 8,	24 23
—— 9,	25 46
—— 10,	25 22
—— 11,	23 19
—— 12,	19 54
—— 16,	05 n.
—— 20,	18 54
—— 21,	22 10
—— 22,	24 30
—— 23,	25 42
July 24°,	25°39′
—— 25,	24 17
—— 26,	21 36
—— 27,	17 46
—— 30,	1 34 n.
—— 31,	4 28 s.
Aug. 3,	20 21
—— 4,	23 43
—— 5,	25 35
—— 6,	25 41
—— 7,	24 16
—— 8,	21 19
—— 12,	1 38 s.
—— 13,	34 4 n.
—— 16,	17 53
—— 17,	21 23
—— 18,	24 1
—— 19,	25 35
—— 20,	25 57
—— 21,	24 59
—— 22,	22 40
—— 23,	19 7
—— 26,	3 1 n.
—— 27,	3 10 s.
—— 30,	19 39
—— 31,	23 17
Sept. 1,	25 29
—— 2,	26 3
—— 3,	25 0
—— 4,	22 28
—— 5,	18 43
—— 8,	3 26 s.
—— 9,	2 3 n.
Sept. 13,	20°34′
—— 14,	23 30
—— 15,	25 26
—— 16,	26 12
—— 17,	25 42
—— 18,	23 52
—— 19,	20 45
—— 23,	1 8 s.
—— 26,	18 44
—— 27,	22 47
—— 28,	25 22
—— 29,	26 18
—— 30,	25 36
Oct. 1,	23 23
—— 2,	19 55
—— 6,	0 23 n.
—— 10,	19 40
—— 11,	22 53
—— 12,	25 9
—— 13,	26 18
—— 14,	26 14
—— 15,	24 53
—— 16,	22 16
—— 17,	18 28
—— 20,	13 9 n.
—— 21,	4 51 s.
—— 24,	22 41
—— 25,	24 54
—— 26,	26 23
—— 27,	26 6
—— 28,	24 11
—— 29,	20 57

P. S.—I have added the above table of the days in the ensuing rainy season (1835) in which the declination of the moon is greater than 17° 30′ and less than 5°, in the hope that those who keep rain gauges in different latitudes and who have not the Almanacks to refer to, may take an interest in the subject, and favour us with some further information.

V.—*Further Note on the Inscription from Sárnáth, printed in the last No. of this Journal.*—*By* B. H. Hodgson, *Esq.*

[In a Letter to the Secy. As. Soc., read at the meeting of the 6th May.]

I have just got the 39th Number of the Journal, and hasten to tell you, that your enigma requires no Œdipus for its solution at Kathmandu, where almost every man, woman, and child, of the Bauddha faith, can repeat the *confessio fidei* (for such it may be called), inscribed on the Sárnáth stone. Dr. Mill was perfectly right in denying the alleged necessary connexion between the inscription, and the complement to it produced by M. Csoma de Körös. No such complement is needed, nor is found in the great doctrinal authorities, wherein the passage occurs in numberless places, sometimes containing but *half* of the complete dogma of the inscription; thus:—"*Yé Dharmá hetu-prabhavá; hetu teshán Tathágata.*" Even thus curtailed, the sense is complete, without the "*Teshán cha yó nirodha, evang (vádí) Maha* Sraman'a," as you may perceive by the following translation:

"Of all things proceeding from cause, the cause is Tathágata;" or, with the additional word, "Of all things proceeding from cause; the cause of their procession hath the Tathágata explained." To complete the dogma, according to the inscription, we must add, "The great Sraman'a hath likewise declared the cause of the extinction of all things." With the help of the commentators, I render this passage thus, "The cause, or causes of all sentient existence in the versatile world, the Tathágata hath explained. The Great Sraman'a hath likewise explained the cause, or causes of the cessation of all such existence."

Nothing can be more complete, or more fundamental, than this doctrine. It asserts that Buddha hath revealed the causes of (animate) mundane existence, as well as the causes of its complete cessation, implying, by the latter, translation to the eternal quiescence of *Nirvritti*, which is the grand object of all Bauddha vows. The addition to the inscription supplied by M. Csoma, is the *ritual application* merely of the general doctrine of the inscription. It explains especially the manner in which, according to the scriptures, a devout Buddhist may hope to attain cessation from mundane existence, viz.

by the practice of all virtues, avoidance of all vices, and by complete mental abstraction. More precise, and as usually interpreted here, more theistic too, than the first clause of the inscription is the terser sentence already given; which likewise is more familiar to the Nipalese, viz. "Of all things proceeding from cause; the cause is the Tathágata:"—understanding by Tathágata, *Adi* BUDDHA. And whenever, in playful mood, I used to reproach my old friend, AMIRTA NANDA, (now alas! no more) with the atheistic tendency of his creed, he would always silence me with, "*Yé Dharmá hetu-prabhava; hetun teshán Tathágata;*" insisting, that Tathágata referred to the supreme, self-existent (*Swayambhu*) BUDDHA*.

Nor did I *often* care to rejoin, that he had taught me *so* to interpret that important word (Tathágata), as to strip the dogma of its necessarily theistic spirit! I have already remarked in your Journal, that the Swobhávika texts, differently interpreted, form the groundwork of the Aiswárika tenets. It will not, however, *therefore*, follow, that the theistic school of Buddhism is not entitled to distinct recognition upon the ground of original authorities; for the oldest and highest authority of all—the aphorisms of the founder of the creed—are justly deemed, and proved, by the theistic school, to bear legitimately the construction put upon them by this school—proved in many ancient books, both Puranika and Tantrika, the scriptural validity of which commands a necessary assent. As it seems to be supposed, that the theistic school has no other than Tantrika authorities for its support, I will just mention the *Swayambhu Purána* and the *Bhadra Kalpavadán*, as instances of the contrary. In a word, the theistic school of Buddhism, though not so ancient or prevalent as the atheistic and the sceptical schools, is as authentic and legitimate a scion of the original stock of oral dogmata whence this religion sprung, as any of the other schools. Nor is it to be confounded *altogether* with the vile obscenity and mystic iniquity of the *Tantras*, though acknowledged to have considerable connexion with them. Far less is it to be considered peculiar to Nepal and Tibet, proofs of the contrary being accessible to all; for instance, the *Pancha Buddha Dhyáni* are inshrined in the cave at *Bágh*, and in the

* The great temple of SWAYAMBHU NA'TH is dedicated to *this* Buddha: whence its name. It stands about a mile west from Kathmandu, on a low, richly wooded, and detached hill, and consists of a hemisphere surmounted by a graduated cone.

The majestic size, and severe simplicity of outline, of this temple, with its burnished cone, set off by the dark garniture of woods, constitute the Chaitya of SWAYAMBHU NA'TH a very beauteous object.

minor temples surrounding the great edifice at *Gyá*; and the assertion of our Ceylonese antiquaries, that there are only five Buddhas, is no other than a confusion of the five *celestial*, with the seven mortal, Buddhas! As I was looking over your Journal, my Newári painter came into the room. I gave him the catch word, "Yé Dharmá," and he immediately filled up the sentence, *finishing with Tathágata*. I then uttered "teshán cha," and he completed the doctrine according to the inscription. But it was to no purpose that I tried to carry him on through De Körös's ritual complement: he knew it not. After I had explained its meaning to him, he said, the substance of the passage was familiar to him, but that he had been taught to utter the sentiments in other words, which he gave, and in which, by the way, the *ordinary* Buddhist acceptation of *Kushal* and its opposite, or *Akushal*, came out. *Kushal* is good. *Akushal* is evil, in a moral or religious sense. Quod licitum vel mandatum: quod illicitum vel prohibitum.

I will presently send you a correct transcript of the words of the inscription, from some old and authentic copy of the *Raksha Bhagavati*, or *Prajná Páramitá*, as you seem to prefer calling it. So will I of De Körös's supplement, so soon as I can lay my hands on the *Shurangama Samádhi*, which I do not think I have by me. At all events, I do not at once recognise the name as that of a distinct Bauddha work. Meanwhile, you will notice, that as my draftsman, above spoken of, is no pandit, but a perfectly illiterate craftsman merely, his familiar acquaintance with your inscription may serve to show how perfectly familiar it is to *all* Buddhists. And here I would observe, by the way, that I have no doubt the inscription on the Dehlí, Allahabad, and Behár pillars is *some* such cardinal dogma of *this faith*.

In the "quotations in proof of my sketch of Buddhism," which I sent home last year, I find the following quotation in proof of the Aiswárika system.

"All things existent (in the versatile world) proceed from some cause; that cause is the Tathágata (Adi Buddha); and that which is the cause of (versatile) existence is likewise the cause of its total cessation. So said Sakya Sinha*.' The work from which this passage was extracted is the *Bhadra Kalpavadán*.

I am no competent critic of Sanscrit, but I have competent authority for the assertion, that Dharmá, as used in the inscription, means not *human actions* merely, but *all* sentient *existences* in the three versatile worlds (celestial, terrene, and infernal). Such is its meaning in the extract just given from the *Bhadra Kalpavadán*, and also in the famous *Yé Dharmanitya* of the *Sata Sahasrika*, where the sense is

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even larger, embracing the substance of all inanimate as well as animate entity, thus: "All things are imperishable," or, "The universe is eternal," (without maker or destroyer.) The passage just quoted from the *Sata Sahasrika* serves likewise (I am assured) to prove that the signification of *yé* is not always strictly relative, but often expletive merely: but let that pass.

The points in question undoubtedly are,—*existence* in the *Pravrittika* or versatile world, and *cessation* of such existence, by translation to the world of *Nirvritti*; and of such translation, animals generally, and not human beings solely, are capable. Witness the deer and the chakwa, which figure so much in Bauddha sculptures! The tales of their advancement to *Nirvritti* are popularly familiar. The word *nirodha* signifies, almost universally and exclusively, extinction, or total cessation of versatile existence; a meaning, by the way, which confirms and answers to the interpretation of *dharmá*, by general existences, entities, and not by merely human actions.

It is scarcely worth while to cumber the present question with the further remark that there *is* a sect of Bauddha philosophers holding opinions which confound conscious actions with universal entities throughout the versatile world, making the latter originate absolutely and *physically* from the former, (see my remarks on REMUSAT in the Journal, No. 33, p. 431.)

It is not, however, admissible so to render generally received texts, as to make them correspondent to very peculiar schismatic dogmata. "*Dháranatmika iti dharmá*," the holding, containing, or sustaining, essence (ens) is *dharmá*. The substratum of all form and quality in the versatile universe, the sustainer of versatile entity, mundane substances and existences, physical and moral, in a word, *all things*. Such is the *general* meaning of *dharmá*. How many other meanings it has, may be seen by reference to a note at the foot of p. 502, No. 34, of your Journal. The root of the word is *dhri*, to hold. WILSON's dictionary gives *Nature* as AMERA SINHA's explanation of *dharmá*. This is essentially correct, as might be expected from a Bauddha lexicographer.

Note.—If Mr. HODGSON's general interpretation of धर्म is the true one, (which seems most probable, though its specification in the sense of *moral duties* is more agreeable to M. CSOMA's supplement)—its implication, in the present reading, at least, appears manifestly atheistic. For that it cannot mean "Tathágata or the A'di BUDDHA *is* the cause," is evident from the accusative hétún (which is also plural *causas*). Even if we were to strike out the word *avadat* or *dha*—the former of which is on the inscriptions, and the latter repeated in Ceylon—still some word of that meaning is plainly understood: and this may help to shew that the explication given by the Aisvaraka Buddhists (as though the words were हेतुरेषां तथागतः hétus tésham Tathágatas) is a more recent invention,—and that the Buddhist system properly recognizes no being superior to the sage expounder of physical and moral causes,—whose own exertions alone

have raised him to the highest rank of existences,—the EPICURUS of this great Oriental system,

qui potuit RERUM cognoscere CAUSAS,
Atque metûs omnes et inexorabile fatum
Subjecit pedibus.

What is mere figure of speech in the Roman poet, to express the calm dignity of wisdom, becomes religious faith in the east; viz. the elevation of a philosophical opponent of popular superstition and Brahmanical caste, to the character of a being supreme over all visible and invisible things, and the object of universal worship.—W. H. M.

VI.—*Description of two new species of Carinaria, lately discovered in the Indian Ocean. By* W. H. BENSON, *Esq. Bengal Civil Service.*

Class.—GASTEROPODA, Cuvier.

Order.—*Nucleobranche,* Blainville.—*Heteropoda,* Lam.

Fam. *Firolidæ,* Rang.

Genus. *Carinaria;*—Bory. Lamarck.

Sp. 1. C. Cithara. *Testa dextra; ultimo anfractu recto, compresso-conico, versùs spiram gradatim et eleganter attenuato, spiram terminalem ferè amplectente, rugis obliquis ornato; aperturâ obliquâ, oblongo-ovatâ, versus carinam coarctatâ; carinâ mediocri, striis sub-rectis signatâ. Habitat in Oceano Indico.*

Shell dextral; the last whorl straight, compressed, conical, gradually narrowing towards the apex, nearly embracing the terminal spire, marked with oblique wrinkles; aperture oblique, oblong ovate, narrowed towards the keel; keel moderate, marked with nearly straight striæ.

The animal of this shell is more narrowed and cylindrical than in any other described species, but as the Carinariæ are said to have the power of inflating themselves, too much stress should not be laid upon this character. The body is attenuated and pointed at the posterior extremity. It is by a line, with not very apparent asperities on the surface, and has a central swimmer (on the side opposed to the shell); but I found no appearance of the caudal swimmer, which is represented in the figures of C. Mediterranea. The male organ, and the parts about the mouth are pale crimson. The viscera contained in the shell are brownish, and the stomach yellowish or brownish, passing into red posteriorly. After death, this red colour is often diffused through the neighbouring parts. The scarf skin is very tender, and strips off the animal, soon after death, in ragged portions.

This shell, with that next to be described, approaches in form to the scarce and precious C. vitrea, which is, with good reason, supposed to be an inhabitant of the Indian Seas. Four specimens, of which two were without the spire, were taken by myself and my companions, between S. Lat. 4° 30′, and N. Lat. 4° 30′, and E. Long. 87° 30′, and W. Long. 90° 30′. They were all taken after night-fall, and from the eagerness with which we plied our nets after I had made known the value

of our discovery, and our want of greater success, it would appear that this and the following species are scarce, even in that region. Both species, like all the others known, are hyaline, and very fragile. Their spires consist of three whorls. The obliquity of the rugæ of the last or straight whorl, together with its straightness and gradual attenuation, will serve to distinguish Carinaria Cithara from any other species. It is named from its resemblance in form and sculpture to a harp.

Sp. 2. C. Galea. *Testa dextra, ultimo anfractu incurvo, compresso-conico, spiram terminalem ferè amplectente, rugis transversis ornato, latè carinato, carinæ rugis perobliquis, recurvatis; aperturâ transversâ, ovatâ, versus carinam coarctatâ. Habitat cum precedente.*

Shell dextral, with the last whorl incurved, compressed, conical, nearly embracing the terminal spire, marked with transverse rugæ, broadly keeled. Keel with very oblique rugæ, which are curved upwards in the direction of the spire. Aperture transverse, ovate, narrowed towards the keel.

The animal resembles that of the preceding species, but the yellowish or brownish colour in the stomach is replaced entirely by pale carmine. Belonging to the same type as the last species, and resembling in form a compressed helmet, the shell is easily distinguishable by the greater curve of the outer edge of the last whorl, which does not decrease so delicately as in that species, as well as by the less obliquity of the rugæ on the body whorl, and the greater obliquity and curvature of those on its very broad keel. The body striæ being parallel with the edge of the aperture, it follows that in the species under review, the mouth is less oblique than in C. Cithara. Its keel, the close embrace of the spire by the last whorl, and the breadth of the latter at this point, will abundantly serve to distinguish it from C. vitrea. The keels of both C. galea and C. Cithara are from their thinness and excessive fragility, very liable to injury even in their native element.

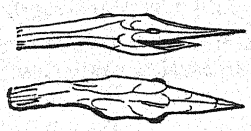
The addition of these two species of Carinaria increases the number known to naturalists to six, the others being C. Mediterranea, fragilis, vitrea, and depressa. Of these one is from the Mediterranean, two from the seas washing the Western Coast of Africa and Madagascar, and the fourth is supposed to belong to the eastern seas.

In N. Lat. 4° 50′, E., Long. 91°. Lieut. McNAIR took two true Carinariæ, the shells of which were replaced by a plate consisting of agglutinated pieces of broken shell, adhering to the suspended viscera. We captured also several species of naked Firolidæ belonging to the genus Pterotrachea.

Calcutta, March, 1835.

VII.—*On a new species of Snake discovered in the Doab.*

A variety of Coluber, undescribed as far as my means of reference allow me to note with regard to the Ophiology of India, having lately come under my observation, it may be worth while to describe the animal, as I observe at page 159 of the 15th vol. of the Encyclopedia Britannica under the head of 'Coluber Mycterizans' a variety described as belonging to North America, very closely resembling that in question. The animal was killed in the dry stony bed of a branch of the Jumna, through which the Doab canal runs, near the Sewálik mountains; its motion, as described to me by the person who killed it, was similar to that of some varieties of caterpillar, who in their progress forwards, elevate the body until the extremities meet, continuing their journey in a system of jerks or steps.



The great peculiarity of this species consists in the proportion of length to breadth, and the extreme prominence of the upper jaw—a sketch of which will be the only way of making it intelligible.

	ft.	in.
Length of animal,	3	$5\frac{1}{2}$
From snout to vent,	2	$2\frac{3}{4}$
Vent to end of tail,	1	$2\frac{3}{4}$
Abdominal plates,	206	
Subcaudal,	170	
Diameter of middle and thickest part of the body,	$\frac{3}{8}$ of an inch.	
Diameter of neck,	$\frac{1}{4}$ ditto.	
Projection of upper jaw over lower,	$\frac{1}{4}$ ditto.	

Color grass green, with a yellowish white line running from the cheek to the end of the tail on each side at the junction at the abdominal and subcaudal plates with the dorsal scales: a double line of the same color running also centrically from the chin to the vent in the centre of the abdominal plates; nose very pointed, and upper jaw extending $\frac{1}{4}$ inch beyond the lower; head flat, one inch long, and $\frac{3}{8}$ inches over the occiput, color of eye raw terra sienna (light); not poisonous, and without fangs.

I subjoin an extract from the Encyclopædia Britannica, as abovementioned.

"Coluber Mycterizans, 'Long-snouted snake;' 192 abdominal plates, 167 subcaudal scales, slender, with a sharp pointed snout: color grass green, with a yellow line on each side of the abdomen. About three feet and a half in length, and half an inch in diameter. Native of North America, where it is often seen on trees, running very quickly in pursuit of insects."

VII.—*Notice of an Extraordinary Fish. By* H. PIDDINGTON, *Esq.*

The following notices of a new and monstrous fish may probably be worth recording in the Journal. They do not altogether agree with those of the fish described in your January No., by Lieut. FOLEY, but there may be more than one species of these monsters.

In December, 1816, I commanded a small Spanish brig, and was lying at anchor in the Bay of Mariveles, at the entrance of the Bay of Manilla. One day, about noon, hearing a confusion upon deck, I ran up, and looking over the side, thought, from what I saw, that the vessel had parted, and was drifting over a bank of white sand or coral, *with large black spots.* I called out to let go another anchor, but my people, Manilla men, all said, " No Sir ! its *only* the *chacon !*" and upon running up the rigging, I saw indeed that I had mistaken the motion of the spotted back of an enormous fish passing under the vessel, for the vessel itself driving over a bank ! My boatswain *(contramestre)*, a Cadiz man, with great foolhardiness jumped into the boat with four men, and actually succeeded in harpooning the fish ! with the common dolphin-harpoon, or *grains*, as they are usually called, to which he had made fast the deep-sea line ; but they were towed at such a fearful rate out to sea, that they were glad to cut from it immediately.

From the view I had of the fish, and the time it took to pass slowly under the vessel, I should not suppose it less than 70 or 80 feet in length. Its breadth was very great in proportion ; perhaps not less than 30 feet. The back so spotted, that, had it been at rest, it must have been taken for a coral shoal, the appearance of which is familiar to seamen. I did not distinguish the head or fins well, from being rather short-sighted, and there being some confusion on board.

As my people seemed to look upon " the chacon," as they called it, almost in the light of an old acquaintance, which indeed it was to many of them who had served in the Spanish gun-boat service, I made many inquiries of them, of which the following is the result.

1. That there were formerly *two* of these monsters, and that they *lived (tenian su casa)* in a cluster of rocks, called Los Puercos, at the S. W. entrance of the Bay of Mariveles ; but that, about ten or fifteen years before this time, or say in 1800, one was driven on shore, and died close to the village in the bay ; the inhabitants of which were compelled by the stench to abandon their houses for a time.

2. That the remaining one frequented the bay of Mariveles and that of Manilla, and it was supposed, that it often attacked and destroyed small fishing boats, which never appeared after going out to fish,

though no bad weather had occurred. This last account I afterwards found singularly corroborated.

3. That it was considered as dangerous by the Spanish gun-boats; that they always when there kept a swivel loaded, the report of which, they said, drove it away. My principal informant was a man employed as a pilot for the ports in the Phillippine Islands, whither I was bound, who had passed his whole life in the gun-boats. He said that one instance of its voracity occurred when he was present. A man, who was pushed overboard in the hurry to look at the monster, being instantly swallowed by it.

4. The native fishermen of the Bay of Manilla quite corroborate this account, and speak of the monster with great terror.

About 1820 or 1821, an American ship's boat, with an officer and few men, was proceeding from Manilla to Cavite; but, meeting with a severe squall and thick weather, they were driven nearly into the middle of the bay. They were pulling in what they thought the best direction, when on a sudden the sailors all dropped their oars! But the mate, who was steering, looking astern of the boat, saw the open jaws of a huge fish almost over him! Having nothing at hand, he threw the boat's tiller into the mouth of the fish! shouting as loud as possible; when, the jaws closing with a tremendous crash, the whole fish, which they described to be more like a *spotted whale!* than anything else, dived beneath the boat, and was seen no more. I do not now recollect the names of the ship, or of the captain, but I thought the circumstance of the *spotted* appearance a remarkable proof that the story was not an invention. "We do not like to tell it," said the American Captain, "for fear of being laughed at; but my officer is quite trust-worthy, and we have learnt from the fishermen too, that there is some strange species of large fish highly dangerous to their boats."

Like the American officer, I fear almost being laughed at, were it not that, could we collect more facts relative to these strange monsters, they might perhaps at least explain some of the "coral spots," so often mentioned in our charts*: independent of its being a matter of great interest to the naturalist. I therefore add here a vague notice of monstrous *spotted* fish, which are known in the Moluccas.

These are called by the fishermen of Ternate, Celebes, &c. a "*Ikan Bintang,*" (or star-fish,) from the bright light which they occasion, and by which they are recognised at great depths at night, in calm weather. The Malay fishermen describe them too as *spotted,* as large as a whale,

* Horsburgh alludes to shoals of Devil fish. *Lophius* being perhaps mistaken for shoals.

and highly destructive of their nets; which they instantly take up when they see the fish, if they can get time to do so; for it is known to destroy boats, and whole lines of nets and fishing stakes, if it once becomes entangled amongst them, to the ruin of the poor fishermen. I had the same account corroborated at the Soolo Islands, both by Malay and by Chinese fishermen; as also at Zebû, in the Phillippine Islands. At Soolo I was shewn large quantities of the skin of a spotted fish, cut into pieces and dried, for sale to the Chinese junks, which my people said was the skins of young "*chacons*"—"*Pero no son estos como nuestro chacon de allá, Senor.*" "But these are not like *our chacon* yonder, Sir," was always added. This skin I should have called that of a spotted shark*: the tubercles were excessively coarse and rough.

It seems thus certain, that some immense *spotted* fish, of highly destructive propensities, resembling in this respect the gigantic shark of the West-Indies, (which is often known to attack and devour the negroes in their canoes, and recently even a man and boat in Boston Bay,)† exists in the seas of the Eastern Archipelago. It is difficult to say, whether the one seen by Lieut. FOLEY was an individual of the same species or not. As already stated, I was unable to see mine with sufficient distinctness, to ascertain any thing beyond its enormous size, great breadth, and spotted appearance. I add such conjectures as my limited knowledge and confined means of reference have enabled me to collect: I offer them only *as* conjectures.

We look naturally, from the voracious habit of these monsters, amongst the Rays or Sharks—*Squalus* and *Raja*—for something to throw light upon what they may be; and it appears that, though these two genera have been classed by BROUSSONNET, BLOCH, and LACEPE'DE, there is still much uncertainty existing as to some of the known species, "which may be placed indifferently in either genus, for the distinctive characters of the Rays are derived from the flatness of their bodies, and those which are least flattened, and the *squalæ* which are so in some degree, approach much to each other."—BOSC *in Nouveau Dict. Hist. Nat. Art. Squale.* As to their size, the largest individual which has been subjected to trust-worthy measurement seems to be that mentioned by LACEPE'DE; a *Squalus maximus*, driven on shore near St. MALO; which was thirty-three feet long, and twenty-four in circumference; but this is far surpassed by the size of those of which, in Europe at

* The tiger shark seems to be rather a *striped* than a spotted shark.

† That some of them are sufficiently formidable, we have lately had evidence. In Boston Bay, a man was recently attacked in his boat, and devoured by one of these animals.—*Encyclopædia Americana, Art. Shark*, 1832.

least, only the fossil remains are found. Bosc, speaking of the SQUALE ROUSSETTE, *Squalus catulus et canicula*, LINN., says of the fossil teeth, "There is in the museum of Natural History at Paris, a tooth, an inch and ten lines long, and two inches nine lines broad; which according to a very moderate calculation, by LACEPE'DE, must have belonged to an individual fifty feet in length! *Art. Squale*, and in another place he says, *Art. Requin*,"—

"The length of the front teeth of a shark thirty feet long is about two inches, and their breadth at the base two and a half; but there is shown at the Museum Nat. His. at Paris, a petrified shark's tooth, found at Dax, near the Pyrenees, which is, also, exclusive of the root, nearly four inches long. The animal to which it belonged must then have been more than sixty feet in length! (LACEPE'DE, from an unquestionable calculation, estimates it at seventy-one feet! and that the jaws were nine feet in diameter!") The authority of LACEPE'DE is so high, that we may fairly conjecture the question of size to be so far set at rest, that Lieut. FOLEY and myself will be acquitted of any exaggeration; and the fact of their swallowing boat and fishermen too, is farther confirmed by BLOCH, (a good authority,) who says, speaking of the preference given by the sharks to putrid flesh, that "the Greenlanders, who frequent a sea abounding in sharks, in little canoes made of the skin of this fish, are careful to make as little noise as possible, to avoid the chance of being swallowed *together with their boat* by these monsters." Its colour is the next remarkable circumstance, and it is worth noticing, that in this all parties agree. The dorsal fin mentioned by Lieut. FOLEY and the lizard-like head I am unable to speak to. It is quite possible however that there may be a genus of these monsters which have the head far less flattened than in general. *Raja rhinobatus*, which seems to connect the two genera, has the snout lengthened.

I suspect the name *chacon* to be a West Indian (Carib or African) one for a shark. I do not find it in any Spanish Dictionary, and I am not aware that it is derived from any of the dialects of the Phillippine Islands. We may hope that ere long some of our whalers may meet with one of these monsters, and thus enable naturalists to form some judgment of what they are. It would be a highly interesting circumstance could we procure some of the teeth, and these should be found to correspond with those at Paris. Perhaps some of your Singapore readers may be enabled to furnish us with more information from the Malay fishermen, if the *Ikan Bintang* is known in those seas.

I had just finished this paper, when I received from my friend Dr. HARLAN, of Philadelphia, the first number of the Transactions of the

Geological Society of Pennsylvania, in which is a most interesting "Critical notice of various organic remains discovered in North America," by Dr. HARLAN. At p. 89, is the following:

"The bones of one species of shark, upwards of forty feet in length, allied to the Carcharias, have occasionally been found in several localities. In CUVIER'S Theory of the Earth, by S. L. MITCHELL, p. 400, it is stated, 'The skeleton of a huge animal was found on the bank of the Meherrin river, near Murfreesborough, N. C. It was dug out of a hill distant sixty miles from the ocean. Captain NEVILLE and Dr. FOWLER, who visited the spot, gathered the scattered vertebræ and laid them in a row thirty-six feet in length. If to this the head and tail be added, the animal must have been fifty feet or more in length, &c. We have recognized them as the remains of a gigantic species of shark.'"

He refers to other specimens, indicating sharks of forty feet or more in length; but this will, I doubt not, be sufficient to show that it is quite probable the fish seen by Lieut. FOLEY and the *chacon* of the Bay of Manilla may be individuals of the same family as those only known to us as yet by their fossil remains.

IX.—*Rules for Calculating the Lengths of the Drop-bars of Suspension Bridges, the Length and Deflection of the Chain, Rise of the Roadway, &c. By Captain* J. THOMSON, *Engineers.*

The application of the following problem in statistics, to find the length of the drop-bars and links of a suspension bridge, has, I believe, the merit of originality; while it will be found extremely convenient in practice, in determining at once the requisite proportions, and obviating the necessity of after adjustment, which will always occur where the curve of such a bridge is assumed as a true catenarian.

If a be the angle of suspension,

b the length in feet of one of the links of the chain,

d the number of drop-bars in each chain; then the tangent of the angle a, divided by one-half $d = n = \frac{2 \text{ Tan. } a}{d}$ is the constant difference between the tangents of the angles formed by the links of the chain with the horizon. These tangents will be as follows: upper link $=$ Tan. a, 2nd $=$ Tan. $a - n$, 3rd $=$ Tan. $a - 2n$ &c. and the lowest $=$ Tan. $a - \frac{d}{2} n$. The sines to radius b, corresponding to these angles, are the differences of the lengths of the drop-bars; and the cosines of these angles are the horizontal distances between the drop-

bars, or the spaces which each link of the chain occupies in the span of the bridge. If therefore the sum of these cosines, multiplied by the radius b, be deducted from the span of the bridge, the difference will be the length of the horizontal space occupied by the two upper links; and half of this space, multiplied by the secant of a, will be the length of one of those links. The sum of all the links will be the length of the chain. The sum of the differences of the drop-bars, added to the deflection of the upper link, will be the total deflection of the chain. The roadway may be made to rise with a fair curve, by making the rise bear a certain proportion to the fall or deflexion of the chain.

The sum of the deflexion of the chain, the length of the centre drop-bar, and the rise of the road, will be the height of the point of suspension at the standard.

Example.

$a = 15°$ = angle of suspension.

$b = 5$ feet = length of each link.

$d = 17$ = number of drop-bars.

98.625 = distance between the points of suspension.

3.5 feet = length of centre drop-bars.

The rise of the road = $\frac{1}{5}$ the deflection of the chain.

$$\text{Tan. } a = .2679492 \quad - n = \frac{2 \text{ Tan. } a}{d} = \frac{.535898}{17} = .0315234.$$

1	2 Tang. of deflection	3 Cosines of deflection.	4 Sines of deflection	5 Differ. of drop-bars in ft.	6 Rise of Roadway.	7 Length of drop-bars.
Upper 1st link, ...	.2679492	.....	.2588	2·5418	.5083	
1st drop-bar, ...						9.4580
2nd,.....	.2364258	.9731	.2301	1·1505	.2301	
2nd,.....						8.0774
3rd,.....	.2049024	.9796	.2007	1·0035	.2007	
3rd, ...						6.8732
4th,.....	.1733790	.9853	.1708	.8540	.1708	
4th,.....						5.8484
5th,.....	.1418555	.9901	.1404	.7020	.1404	
5th,.....						5.0060
6th,.....	.1103321	.9939	.1096	.5480	.1096	
6th,.....						4.3484
7th,.....	.0788087	.9969	.0785	.3925	.0785	
7th,.....						3.8774
8th,.....	.0472853	.9988	.0472	.2360	.0472	
8th,.....						3.5942
9th,.....	.0157618	.9998	.0157	.0785	.0157	
Centre drop-bar, ..						3.5000

7.9175 = sum of the cosines multiplied by
5 = × b

39.5875 = horizl. dist. between drop-bars.
49.3125 = ½ span.

9.5250 = difference.

1.0352 × secant of 15°.

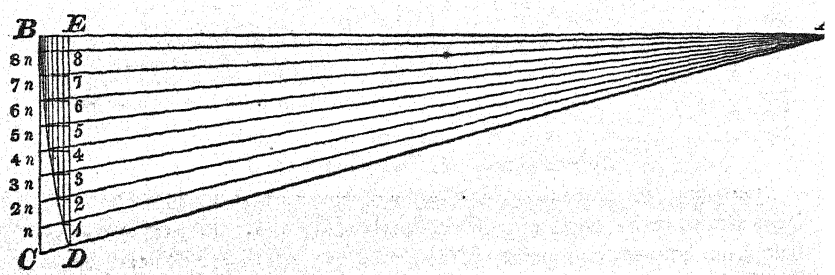
9.8602 = length of upper link.
.2588 = × sine of deflexion 15°.

2.5418 = deflection of upper link.

ft. in. ft. in.
5 × 16 + 9.8602 × 2 = 99.7204 length of chain.
The sum of column No. 5 = 7.5068 deflection of ditto.
Ditto No. 6 = 1.5014 rise of roadway.
7.5068 + 1.5214 + 3.5 = 12.5082 height of the point of suspension at standard.

N. B. Column 5 is found by multiplying column 4 by 5 feet.
Column 6 is one-fifth of column No. 5.
Column 7 is equal to columns 5th + 6th + 3 .5 feet.

The geometrical construction of this problem will answer as a proof to the foregoing rule, and will be of assistance in making plans of suspension bridges.



In the right-angled triangle ABC make the angle A = 15° = angle of suspension, and the side AB = 5 feet = length of one link of the chain. Divide the side CB into as many spaces, commencing at C, as there are drop-bars in $\frac{1}{2}$ the space = $8\frac{1}{2}$ spaces, and join A*n* A 2 *n*, &c. From the centre A with the radius AB describe the arc BD, and complete the lines shewing the sines and cosines of the angles formed by the line AB and the radii A*n*, A 2 *n*, A 3 *n*, &c. Then as these radii are parallel to the links of the chain, the sines of the angles E 1, E 2, E 3, &c. are the differences between the lengths of the drop-bars 1, 2, 3, 4, &c. and the cosines of these angles are the spaces which the links of the chain occupy in the space of the bridge. Supposing *n* = length of the centre drop-bar, the other drop-bars will be as follows:

Centre bar *n*.

8th, *n* + E 8.

7th, *n* + E 8 + E 7.

6th, *n* + E 8 + E 7 + E 6, and so on. This does not include the rise of the road, however, which is an arbitrary quantity.

X.—*Table shewing the Weight or Pressure which a cylindrical wrought-iron Bolt will sustain when supported at the ends, and bonded in the middle of its Length. By Captain* J. THOMSON, *Engineers.*

Leng. of bearg.	In. ¾	In. ½	In. ¾	In. 1	Ins. 1¼	Ins. 1½	Ins. ¾	Ins. 2	Ins. 3	Ins. 4	Ins. 6	Ins. 8	Ins. 10	Ins. 12
Wt. in Tons.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. In.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.	Dm. Ins.
2	·57	·72	1·82	·9	·97	1·03	1·09	1·14	1·3	1·44	1·64	1·8	1·95	2·06
4	·72	·9	1·03	1·14	1·23	1·3	1·37	1·44	1·64	1·8	2·06	2·28	2·46	2·6
6	1·*	1·03	1·18	1·3	1·4	1·49	1·57	1·64	1·88	2·06	2·36	2·6	2·81	2·98
8	1·33	1·14	1·3	1·43	1·54	1·64	1·75	1·8	2·07	2.28	2·6	2·86	3·09	3·28
12	2·	1·3	1·49	1·64	1·27	1·88	1·98	2·06	2·37	2·6	2·98	3·28	3·54	3.7
16	2·66	1·43	1·64	1·81	1·95	2·07	2·18	2·28	2·61	2·86	3·28	3·62	3·90	4·14
20	3·33	1*66	1·77	1·95	2·1	2·23	2·35	2·46	2·81	3·1	3·54	3·90	4·20	4·46
24	4·	2·	1·88	2·07	2·23	2·37	2·49	2·61	2·98	3·28	3·76	4·14	4·46	4·74
28	....	2·33	1·98	2·18	2·35	2·49	2·63	2·75	3·15	3·46	3·96	4·36	4·70	4·98
32	....	2·66	2·07	2·28	2·45	2·61	2·75	2·87	3·29	3·62	4·14	4·56	4·91	5·22
40	....	3·33	2·23	2·46	2·64	2·81	2·96	3·09	3·54	3·9	4·46	4·92	5·29	5·62
48	.*..	4·	2·*5	2.61	2·81	2·98	3·15	3·29	3·76	4·14	4·74	5·22	5·62	5·96
56	....	....	3·11	2·75	2·96	3·14	3·31	3·46	3·96	4·36	4·98	5·50	5·92	6·28
64	....	....	3·55	2·87	3·09	3·28	3·46	3·62	4·14	4·56	5·22	5·74	6·19	6·56
72	....	....	4.	3·*	3·21	3·42	3·60	3·76	4·30	4·74	5·42	5·96	6·43	6·84
80	....	....	....	3·33	3·33	3·54	3·73	3·9	4·46	4·91	5·62	6·18	6·67	7·08
88	....	....	....	3·66	3·44	3·65	3·85	4·02	4·60	5·07	5·8	6·38	6·88	7·30
96	....	....	....	4.	3·54	3·76	3·96	4·14	4·74	5·22	5·96	6·58	7·08	7·52
104	....	....	....	....	3·63	3·86	4·07	4·25	4·87	5·36	6·14	6·74	7·27	7·72
112	....	....	....	....	3·72	3·96	4·17	4·36	4·99	5·49	6·28	6·92	7·45	7·92
120	....	....	....	....	4·*	4·05	4·26	4·46	5·11	5·62	6·44	7·08	7·63	8·10
128	....	....	....	.. .	4·3	4·14	4·36	4·56	5·21	5·74	6·56	7.24	7·8	8·28

Observations on the foregoing Table.

There are two ways in which the bolt may be broken, either by a cross strain, or by detrusion, which is the pulling out the part of the bolt from between the points of support: besides these two ways in which the fastening may be broken, the bolt may crush and cut away the eye of the link which presses upon it.

‡ If w=weight or pressure in tons,

l=length of the bolt between the points of support in inches,

d=diameter of the bolt in inches, then $d=(.37\ w\ l)^{\frac{1}{3}}$ to support a cross strain; but when l becomes less than $\left(\frac{w}{267}\right)^{\frac{1}{2}}$ the bolt will be liable to detrusion, to avoid which, $d=(.08\ w)^{\frac{1}{2}}$. But detrusion can never take place when both the bolt and the link are formed of iron, or the same metal, because when l becomes less than $\left(\frac{w}{71.5}\right)^{\frac{1}{2}}$ the link may be cut by the bolt; to obviate which, the value of d should be $=\frac{w}{24\ l.}$ This last equation supersedes the first

‡ These rules are taken from TREDGOLD, the arbitrary quantities assumed by him being corrected by a comparison made, and a mean, taken from the best authorities.

when $w = 71.5\ l^2$. This place is marked * in the table.

Remarks on keys, hold-fasts, &c.

Put b = the breadth in inches,
d = the depth in inches,
w = weight in tons,
l = length of bearing in inches; then the breadth should never be made less than $\frac{w}{24\ l}$, and the section $bd^2 = .37\ w\ l$, or $d = \left(\frac{37\ wl}{b}\right)^{\frac{1}{2}}$.

As an example, suppose a bar 1 inch square to support 8 tons was fastened by a key; required the breadth and depth?

$w = 8$.—$l = 1$ and $\frac{w}{24\ l} = \frac{}{24} = \frac{1}{3} = b$ or the breadth required,

$\therefore d = \left(\frac{37 w\ l}{b}\right)^{\frac{1}{2}} = \sqrt{8.88} = 2{\cdot}98$ inches, the depth required.

To support the accuracy of this table, a set of experiments was commenced, but the results from them were so unsatisfactory, that they were not continued. But during the proof of three bridges in which bolts of from $1\frac{1}{4}$ in. to $2\frac{1}{4}$ in. were used, with various lengths of bearing, and pressures of from 20 to 15 tons, the dimensions marked in the table were found sufficiently strong in every instance; but the diameter of the bolt thus given could not be reduced much, or what was the same thing, the length of bearing could not be decreased without a risk of failure.

The best Swedish iron bolts did not sustain a greater pressure than the ordinary English bolt iron, (rolled, not hammered.) The Swedish iron when strained in excess bent, and became dented as in the marginal figure: the side a was bulged or rose half as much as b was indented or bent, on the other side; when the bolts were formed of English bolt iron (unhammered), numerous cracks opened on the convex surface of the bolts at a and $c\ c$, when the indentation at b amounted to $\frac{1}{18}$ of the diameter of the bolt; the bolt failed by these cracks meeting each other, and the centre part of the bolt was drawn out.

The bars, which these bolts connected, were calculated to sustain 9 tons per square inch of section, and the eyes 7 tons, but when the whole were proved by a tension $\frac{1}{3}$rd greater than the calculated strength, the eyes broke more frequently than either the bars or bolts.

The following table, for which we are also indebted to Captain J. THOMSON, Engineers, will serve as a practical continuation of the observations on roofing, in the last number of the Journal.

XI.—*A Table of the Scantlings of Beams of Teak or Saul Wood, to sustain a Terrace Roof not exceeding seven inches in thickness; the deflexion not to exceed one-fortieth of an inch for each foot of length.*

Distance apart of Beams, one foot from centre to centre.	LENGTH OF BEARING IN FEET.														
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
Breadth. Inches.	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches	Depth Inches
0½	6.	8·	10·	12·	14·	16·	18·	20·	22·	24·					
1	4·76	6·35	7·94	9·53	11·1	12·7	14·3	15·9	17·5	19·1	20·7	22·2	23·8		
1½	4·16	5·54	6·92	8·32	9·7	11·1	12·5	13·9	15·3	16·7	18·1	19·4	20·8	22·2	23·6
2	3·78	5·04	6·3	7·56	8·82	10·1	11·3	12·6	13·14	15·1	16·4	17·6	18·9	20·1	21·4
2½	3·5	4·67	5·85	7·02	8·18	9·35	10·6	11·7	12·10	14·	15·2	16·4	17·6	18·7	19·9
3	3·3	4·4	5·5	6·6	7·7	8·81	9·91	11·	12·8	13·2	14·3	15·4	16·5	17·6	18·8
3½	—	4·18	5·23	6·27	7·32	8·36	9·41	10·5	11·5	12·6	13·6	14·6	15·7	16·7	17·8
4	—	4.	5·	6·	7·	8·	9·	10·	11·	12·	13·	14·	15·	16·	17·
4½	—	—	4·81	5·77	6·73	7·69	8·65	9·61	10·6	11·5	12·5	13·5	14·5	15·4	16·
5	—	—	—	5·57	6·5	7·42	8·35	9·28	10·2	11·1	12 1	13·	13·9	14·8	15·8
5½	—	—	—	—	6 29	7·19	8·09	8·99	9·89	10·8	11·7	12·6	13·5	14·4	15·3
6	—	—	—	—	6·11	6·99	7·86	8·73	9·61	10·5	11·3	12·2	13·1	14·	14·9

Burgahs require to be made six times stiffer than beams, in order to prevent cracks in the terrace roof; and as they are invariably placed one foot apart, and have a breadth of three inches, they should be as many inches in depth as they are feet in length of bearing between the beams.

Explanation of the Table, with Examples of its use.

The table shews on inspection the scantlings of beams to support roofs not exceeding 80 lbs. per square foot, including the weight of the timber. It has been calculated, according to the rule in TREDGOLD's Carpentry, Section II. par. 90, the value of the constant quantity, *a* being taken at ·01. The scantlings given in the table are measured in the middle of the beam; the lower side is supposed to be cut straight, and the upper side with a curve of one or two inches, versed sine, for each 10 feet in length of the beam.

As the stiffest beam that can be cut out of a round timber has its breadth to its depth in the proportion of ·6 to 1 nearly, the proportion of the breadth to the diameter will be as ·5 to 1, or the breadth will be $\frac{1}{2}$ the depth.

As the cost of timber is partly proportioned to its contents, the deeper the beams are made, the cheaper the roof will be within certain limits; and as the cutting of timbers through the heart or centre of the wood is supposed to render the beams more durable, all the timbers should be cut into two beams, particularly as the strength of the timber is not at all reduced by this measure.

There is, however, a proportion between the depth and breadth which cannot be exceeded without the risk of the beam breaking sideways. TREDGOLD's rule is, (Sec. II. par. 82,) "the breadth in inches should not be less than six-tenths of the length in feet, divided by the square root of the depth in inches."

As the weight on each of the beams is proportioned to the distance between them; and as the strength of the beam is proportioned to its breadth: the breadth in inches, as marked in the first column of the table, must be multiplied by the distance in feet between each beam, measured from centre to centre for the breadth of the beam; or, if the breadth of the beams are given, the distance in feet between them is found by dividing their breadth by the breadth in the first column of the table.

Examples.

A room, 22 feet by 33 feet, has to be roofed in, the timbers provided for which are round, 18 inches diameter in the middle, and 25 feet long. It is required to know the most economical manner of cutting them up, the scantlings of the beams, and their distance apart.

The stiffest beam that can be cut out of an 18 inch tree is 9×15, or if cut into two timbers, $4\frac{1}{2} \times 15$, to ascertain if this timber will be so thin as be liable to break side-ways, the rule for this purpose will be applied as follows: $\frac{.6 \times 22}{\sqrt{15}} = \frac{13.2}{3.87} = 3.4$ in. the least breadth; the beams $4\frac{1}{2} \times 15$, are therefore not too thin. By referring to the table, under 22 feet length of bearing, a depth of 15 inches requires a breadth of $1\frac{1}{2}$ inches. The breadth of the timber, $4\frac{1}{2}$, being divided by $1\frac{1}{2}$, gives 3 ft, the distance from centre to centre of the beams; this distance gives 11 spaces, or 10 beams, or 5 timbers in the 33 ft.

The timbers of the dimensions above stated could be cut into two beams 12.7×6.4, having a greater section than that given above, $15 \times 4\frac{1}{2}$; but on a reference to the table in the column of 22 feet length, and 12·9 in depth, the breadth is $2\frac{1}{2}$ inches, and 6·4, divided by 2·5, gives 2 feet 8 in distance from centre to centre, if beams requiring $12\frac{1}{2}$ spaces, or 12 beams, or 6 timbers.

2nd Example.

Beams $8\frac{1}{2} \times 12$, having been provided for a roof of 22 feet span—required to know the distance they are to be placed apart. In column of 22 feet span, opposite a depth of 12 inches, is a breadth of 3 inches, and $8\frac{1}{2}$ divided by 3, gives 2 feet 10 inches as the distance from centre to centre, at which the beams ought to be placed.

3rd Example.

Proposed to roof a room 18 feet wide, with timber placed 1 foot 3 inches from centre to centre, so as to be covered with tiles instead of burgahs, the deepest timber procurable being 9 inches, required the breadth of the beams.

In the column of the span of 18 feet, and a depth of 9 inches, the breadth is 4 inches, which multiplied by $1\frac{1}{4}$, gives 5 inches for the breadth of the beam.

J. T.

XII.—*On the Temperature of Deep Wells to the west of the Jamna.*

By the Rev. R. Everest.

During the last cold weather and the present, I have paid some attention to the temperature of wells in the country to the west of the Jumna. They are not usually more than 30 or 40 feet deep within a few miles of the river, but beyond Rhotak, about 50 miles to the west of this, on the road to Hansi, they are not less than 110 or 120 feet deep, and, in one instance I have met with (that of the fort at Hansi) 160 feet. Farther than that I cannot speak from examination, but all accounts agree in stating those in the Bikanír country to be the deepest, probably not less than 350 feet. I have almost invariably found the temperature to increase with the depth, but the increase is modified by three circumstances.

1st. By the locality, as in the case of a pool of water being near, or the mouth of the well being broad in proportion to its depth, both which causes tend to lower the temperature in the cold weather.

2ndly. By the season of the year at which the observation is made. The tendency of the rains is to reduce all wells to the uniform temperature of 78°, which is about that of the rain-water when it falls. From this cause the deep wells are at their minimum about the autumnal equinox, and get warmer during the cold weather. On the contrary, the more superficial ones become colder during the same period.

3rdly. By the quantity of water that is drawn from them. Those that are not used are usually the lowest, and those where oxen are working for the purpose of irrigation by a great deal the highest. I have only to premise further that the mean temperature of the year here, according to Major Oliver's observations, is 76°. The general results I have obtained are as follows:

No. of wells.	Depth to bottom.	Temperature at the bottom.
1. Mean of 10 observations made at nearly equidistant periods throughout the year,	42 feet.	78·6
3 observations,	60	79·2
6 ditto,	80 to 100	79·0
5 ditto,	110 to 120	79·8
1 ditto,	160	80·0

The increase in Europe is said to be 1° centigrade, or 1°· 8 Farht. for every 35 or 37 metres (about 105 or 110 feet English), of depth. Were I to select from my observations those made where bullocks were working for the purposes of irrigation, the increase would be much more rapid than what I have above stated. Thus:

No. of wells.	Depth to bottom.	Temperature.
2	60	81
3	90	81·9
2	120	82·7

I do not publish these observations with the idea that they are sufficiently numerous to establish any general law on the subject for this country, but because my avocation here does not permit me to extend them, and in the hope that some one who may hereafter travel through the Bikanír country may be induced to take up the subject, for there alone can any considerable depth beneath the surface be attained.

P. S.—Lieutenant TREMENHEERE, of the Engineers, in leaving this on the Shekawatti campaign, had the kindness to promise that he would make some observations on the temperature of the deep wells that lay in his route, and this he has performed with great zeal and assiduity. He has now placed the results he obtained in my hands, and I have drawn up the following abstract of them:

No. of Wells observed.	Depth.	Aver. Temp.
13....	40 to 80 feet.	78°
6....	80 to 120	79°. 4
4....	120 to 140	81°

These observations were made throughout a large tract of country lying between 28 and 26° N. Lat. and 78 to 76° E. Long. And the time of the year in which they were made was from the 26th October to the 28th February. The mean temperature of the year for the surface may be reckoned at 75°, if, as stated by Lieut.-Col. OLIVER, that of Dehli be 73°. 4.

I see that in the above paper on this subject I have misquoted this same datum of Colonel OLIVER's, calling it 76°. I took the number carelessly from the wrong column, owing to its suiting so well to Dr. ROYLE's observations at Seháranpur, who makes the mean of that place, I believe, 73°. 5. One or other of the two observations must now be rejected.

XIII.—*Abstracts of a Meteorological Register kept at "Caineville," Musooree (Masúri.) By* S. M. BOULDERSON, *Esq.*

1834.

		Bar.	*Therm. attd.*	*detd.*
From 15th to end of May,	8 observations at 10 A. M.	23.919	75	78.1*
	9 ,, at 4 P. M.	23.894	75.6	79.5*
	10 ,, at 10 P. M.	23.905	74.8	75.7

Mean temperature at 10 A. M. and 10 P. M. 76°9.

Bar. at 4 P. M. compared with 10 A. M.

Mean diff.	*greatest.*	*least.*
(6 obsrs.)—0.043	—0.060	—0.026

Bar. at 4 P. M. compared with 10 P. M.

Mean diff.	*greatest.*	*least.*
(7 obsrs.)—0.054	—0.066	0.004

		Bar.	*Therm. attd.*	*detd.*
June,.....	25 observations at 10 A. M.	23.897	71.8	70.3
	22 ,, at 4 P. M.	23.815	71.4	71.1
	23 ,, at 10 P. M.	23.870	71.5	68.0

* I think that the temperature at 10 A. M. and 4 P. M. was considerably raised by reflection. This was modified or obviated in the subsequent months.

Mean temperature at 10 A. M. and 10 P. M. 69°1.

Bar. at 4 P. M. compared with 10 A. M.			Bar. at 4 P. M. compared with 10 P. M.		
Mean diff.	*greatest.*	*least.*	*Mean diff.*	*greatest.*	*least.*
(18 obsns.)—0.073	—0.212	+0.040	(18 obsns.)—0.048	—0.210	+0.014

				Bar.	*Therm. attd.*	*detd.*
July,	25	observations	at 10 A. M.	23.896	69.9	67.5
	13	,,	at 4 P. M.	23.830	69.2	68.5
	28	,,	at 10 P. M.	23.879	69.6	67.2

Mean temperature at 10 A. M. and 10 P. M. 67°35.

Bar. at 4 P. M. compared with 10 A. M.			Bar. at 4 P. M. compared with 10 P. M.		
Mean diff.	*greatest.*	*least.*	*Mean diff.*	*greatest.*	*least.*
(12 obsns.)—0.053	—0.112	+0.032	(12 obsns.)—0.043	—0.104	+0.062

				Bar.	*Therm. attd.*	*detd.*
August,	25	observations	at 10 A. M.	23.917	69.1	68.5
	19	,,	at 4 P. M.	23.864	68.3	67.5
	28	,,	at 10 A. M.	23.900	68.9	66.4

Mean temperature at 10 A. M. and 10 P. M. 67°4.

Bar. at 4 P. M. compared with 10 A. M.			Bar. at 4 P. M. compared with 10 P. M.		
Mean diff.	*greatest.*	*least.*	*Mean diff.*	*greatest.*	*least.*
(17 obsns.)—0.060	—0.090	—0.022	(16 obsns.)—0.023	—0.066	+0.018

				Bar.	*Therm. attd.*	*detd.*
September,	25	observations	at 10 A. M.	23.994	67.7	67.2
	13	,,	at 4 P. M.	23.918	67.5	66.8
	24	,,	at 10 P. M.	23.960	68.1	65.5

Mean temperature at 10 A. M. and 10 P. M. 66°35.

Bar. at 4 P. M. compared with 10 A. M.			Bar. at 4 P. M. compared with 10 P. M.		
Mean diff.	*greatest.*	*least.*	*Mean diff.*	*greatest.*	*least.*
(12 obsns.)—0.064	—0.106	+0.006	(11 obsns.)—0.031	—0.086	+0.036

				Bar.	*T. attd.*	*detd.*
October,	23	observations	at 10 A. M.	24.084	61.5	62.2
	19	,,	at 4 P. M.	24.012	61.5	61.96
	20	,,	at 10 P. M.	24.050	61.8	58.63

Mean temperature at 10 A. M. and 10 P. M. 60°41.

Bar. at 4 P. M. compared with 10 A. M.			Bar. at 4 P. M. compared with 10 P. M.		
Mean diff.	*greatest.*	*least.*	*Mean diff.*	*greatest.*	*least.*
(17 obsns.)—0.072	—0.140	—0.032	(16 obsns.)—0.043	—0.128	—0.008

NOTE.—From the 2nd to the 9th, no observations taken.

				Bar.	*T. attd.*	*detd.*
November 1st to 21st.	17	observations	at 10 A. M.	24.158	57.5	57.4
	10	,,	at 4 P. M.	24.104	57.6	56.4
	19	,,	at 10 P. M.	24.128	57.8	53.9

Mean temperature at 10 A. M. and 10 P. M. 55° 6.

Bar. at 4 P. M. compared with 10 A. M.			Bar. at 4 P. M. compared with 10 P. M.		
Mean diff.	*greatest.*	*least.*	*Mean diff.*	*greatest.*	*least.*
(9 obsns.)—0.052	—0.074	—0.026	(10 obsns.)—0.034	—0.058	—0.014

Mean of the mean temperatures from 15th May to 21st November, 66°17.

Height of Caineville, by comparisons with Calcutta Barometer.

By mean of 80 observations at 10 A. M. from 16th May to 31st August,	*Above Calcutta.*
	feet 6287.5
By mean of 49 observations, at 4 P. M. do. do.	6285.9
By mean of 30 ditto, at 10 P. M. July to August,	6274.7
Mean,	6282.7
By 61 observations, Caineville above Seharanpur,	5346.7
Seharanpur above Calcutta,	1012.3
	6359

XIV.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 6th May, 1835.

Captain M. G. WHITE, Senior Assistant Commissary, Arracan, proposed at the last Meeting, was duly elected a member of the Society.

Professor LEA and Dr. R. HARLAN, of Philadelphia, proposed as honorary members at the last Meeting, were upon the favorable report of the Committee of Papers, balloted for and duly elected.

Read the following report of the Committee appointed, at the last meeting of the Society, to consult with the Baron HUGEL on the expediency and on the best means of procuring from Europe a competent Curator for the Museum.

"Although the measure of sending to Europe for a qualified curator would ensure the establishment of a museum in Calcutta, upon a footing such as has not hitherto been known here, and perhaps on a par with those in more favorable climates; and although the unexplored and extensive field around us promises an ample store of novelties, such as would render our museum in time an object of attention to naturalists both here and at home, still it cannot be concealed that there are several points of view under which the scheme of procuring a curator from Europe does not appear the most favorable for the end to be accomplished.

"The Baron HUGEL has favored the Committee with his opinion, that a competent naturalist, that is, a person acquainted with the branches of Zoology, might be induced to accept the situation on a salary of 200 rupees a month. By making this sum payable from the day of his embarkation from Europe, a separate allowance for passage money and outfit might perhaps be obviated, and a similar provision might be made in case of his return home: The Baron's recommendations through his friends at Vienna or Paris, would also be a guarantee that the person selected should meet the Society's expectations, and faithfully perform the duties assigned to him, while health should last: but he must necessarily incur much expence on his leaving his own country; he would here be altogether dependent on the Society in case of sickness, or he might become a burden, were he to prove inadequate to perform his duty. It could not be expected that the same individual should be a mineralogist or a geologist: these branches therefore (and they are important to us,) would still be deficient. Again, though he might learn a little English on his way out, he would hardly be able to write descriptions, for publication, of the new objects of Natural History, which might fall under his notice.

"These considerations have led your Committee to listen favorably to a modification of the original plan, which offers the opportunity of providing a curator on the spot.

"Dr. PEARSON, your late honorary curator, in resigning this situation a short time since, stated that he had found it impossible to do much hitherto for the museum, while acting gratuitously: his distance from the premises: his attention to his own collection, naturally interfered to prevent his attention being given to a secondary object. These difficulties would however be in a great measure removed were he to receive such allowance as the Society might determine to devote to the purpose of creating and maintaining a museum: indeed he would be willing to accept the office at 150 rupees per month, which would be a positive saving of 50 to the Society, a material consideration in the actual state of its finances: This sum would enable him to take a house near the spot, or to procure the means of conveyance till he could get one suitable: it would purchase as it were his exclusive services: for it he would consent to relinquish the further prosecution of his own private collection, and to devote his whole leisure to the Society's museum. On the other hand, being in the Company's Medical Service, he could at no time become a burthen to the Society, which would be at liberty to annul its engagement with him at any time, should a fair trial prove that the object of forming a creditable museum was not attained, or was no longer desirable.

"Your Committee therefore is unanimous in recommending, in modification of the resolution of the 1st April, that the services of Dr. PEARSON be secured at the rate of 150 rupees per mensem, for a limited term at first, say one year, at the expiration of which it would be seen whether or not it would be desirable to continue the system, or to have recourse to the obliging assistance of the Baron HUGEL to procure a regular curator from Europe."

(Signed) E. RYAN.
W. MORRISON.
W. H. MACNAGHTEN.
J. T. PEARSON.

After some discussion, it was resolved; that the Society should avail itself of the services of Dr. J. T. PEARSON as curator, and that a sum of 200 rupees per mensem should be devoted to the purposes of the museum for the period of one year: the 50 rupees excess being intended for contingencies, cabinets, &c. or for an assistant, for the office of which M. BOUCHE' of Chandernagore was an applicant.

A letter from J. B. GARDNER was read, proposing to repair the monument of Sir W. JONES, in the church-yard, for rupees 250. Referred to the Committee of Papers.

Read a letter from Mr. J. K. KANE, Secretary of the American Philosophical Society, forwarded by Mr. T. RYAN, acknowledging the receipt of Part 2nd of volume xviii. of the Asiatic Researches.

Library.

Read a letter from Monsieur M. D'AVEZAC DE MACAYA, Secretary to the Geographical Society of Paris, &c. &c. presenting two pamphlets.

1.—"Examen et Rectification des Positions determinés Astronomiquement en Afrique par Mungo Park."

2.—"Notice sur L'apparition nouvelle D'un Prophête Mussulman en Afrique."

The following books were also presented.

Transactions of the Medical and Physical Society of Calcutta, Part 2 of volume vii.—*by the Society, through Dr.* HUTCHINSON, *Secretary.*

The Indian Journal of Medical Science, volume 2nd, Nos. 16, 17—*by the Editors.*

Madras Journal of Literature and Science, No. 7—*by the Madras Literary Society.*

SCOTT WARING'S Tour to Shiraz by the route of Kazroon and Feerozabad—*by* H. N. THAKUR.

Meteorological Register for March, 1835—*by the Surveyor General.*

Dr. R. HARLAN'S Fauna Americana, presented for the author—*by Mr.* H. PIDDINGTON.

Antiquities.

A letter was read from Mr. J. B. ELLIOTT, Commissioner of Patna, forwarding an impression taken in sheet-lead of an inscription on the plinth of some figures of the *Avatars*, sculptured on a black stone which he obtained at Kesariah in the neighbourhood of the mound depicted in the last No. of the Journal.

A note on the interpretation of the line was read by the Rev. Dr. MILL.

Extracts of a letter from Captain WADE were read, communicating interesting accounts of further progress made by M. MASSON in his exploration of the Afghán topes.

Extracts of letter from Mr. Masson to Captain Wade, dated the 15th July, 1834.

"I had the pleasure of addressing you from Peshâwar about the middle of May, and now avail myself of a Cossid proceeding to Cabúl to transmit through your Agent MEER SYAD KARAMAT ALI, a brief account of my proceedings since that time.

"In three or four days after I wrote you, I left Pesháwar for SÚLTAN MAHOMAD KHAN'S Camp at Sheikan, and thence proceeded to Jalálabad by the route of Abkanu. On arrival there, I recommenced operations on the topes remaining in that vicinity, and these labors have fully occupied me until this time, and continue to do so.

"I rejoice to say that very fair success has attended my operations; of seven unpromising topes, as to appearance, opened near Chaharbágh of Jalálabad, four yielded results satisfactory, one of which will be interesting from the coins therein discovered. Of fourteen topes and tumuli opened at Hiddáh, the greater portion have alike yielded the wished-for results in relics and medals; one produced a very splended collection of relics and a great number of coins, the major part silver Sassanian, but also seven gold ones, of which singular to relate, are five of *Roman Emperors*, two of THEODOSIUS, two of LEO, and one of MARCIANUS. These coins are themselves curious, and the discovery of them in such a place is not less so, and they may be of great use in assisting to ascertain the epoch when the monument containing them may have been built.

"I note the legends of the coins*, I have discovered for your information, and when I receive your reply to this letter, shall forward to Mr. PRINSEP, for publication in his Journal, an account of this interesting tope, and of the relics and coins extracted.

"I continue to hear of or to fall upon others of these monuments in a variety of situations, and as their importance is obvious, shall not relax in the pursuit of their identification: they will fully occupy me until the winter, therefore I must defer a visit to the countries north of the Hindu Kush until the next season.

"*The 30th September*, 1834. Nearly a month since I arrived in Cabúl and took in hand a tope which had been opened and abandoned by M. HONIGBERGER, at a spot called Gool Durah: from this were extracted eight fine gold coins with etcetera, seven of them of the king KADPHICES: the eighth of a prince of the same family. I am now in the Kohistan for the purpose of operating on two topes in critical spots, availing myself of the presence of MAHMAD AKBAR, DOST MAHOMED KHAN'S son. My collection of coins this year will far exceed that of the last, and I have found several new ones. Last night I procured a copper Menander of very large size, and at Cabúl I gained a silver one more large and beautiful than any that I have seen or heard of. When the year's labors close I shall draw up the result, and I hope to be able to identify another Greek monarchy distinct from those of Bactria and Nysa."

In a letter to Colonel POTTINGER, M. MASSON gives further particulars of the Hiddáh Tope. "The relics found there comprise a handsome gold box with cover set with gems, and at the top a fine blue stone; this was originally filled with a liquid perfume, in which musk predominated. This box was enclosed in a larger silver one: with this was also a smaller silver one, containing four Sassanian coins, one or two gems, and an unctuous substance. The whole was contained in a box of iron, gilt, and this again was enclosed in a large copper vessel handsomely washed with gold, which was half filled with a liquid mixed with earth and impregnated with the oxyd of copper. In this copper vessel were 180 silver Sassanian coins, and two golden, probably Hindu, with three copper ones of Koveen (?) types. In the iron gilt box were three *golden Roman coins*, and in the golden box within it, two others of THEODOSIUS; the former were one of MARCIANUS and two of LEO. In the copper vessel moreover were two gold rings, on one of them the gem engraved with the head of a sovereign, and among the detached gems is another one engraved. Besides the gold ones there is a multitude of plain silver ones, and a variety of fragments of ornaments: upon the whole this has been the richest prize yet produced from any of the topes opened."

[M. MASSON'S correspondence with Col. POTTINGER, with a sight of which we have been favored, contains lists of all the relics hitherto collected by him, and held at the disposal of the Bombay Government, in consideration of the

* As we may expect a full account hereafter, it is needless to insert the legends here; they are evidently genuine Roman coins.

pecuniary assistance accorded him through Colonel POTTINGER. The number of coins sent to this officer amounts to upwards of 2220. They could not be in better hands, and we trust soon to hear of their introduction to public notice with the advantage of his learned elucidations. The number of topes excavated up to the present moment has been in Duroonter, 10; at Chaharbágh 7; and at Hiddáh 14. Mr. MASSON's promised communication to ourselves will, without doubt, contain the particulars of all these.]

A notice by Mr. B. H. HODGSON on the Sárnáth inscription was communicated.

[Printed in the present No.]

Physical.

A letter from Colonel CASEMENT, Secretary to Government, Military Department, was read, forwarding an extract of a dispatch from the Honorable Court of Directors, expressive of the interest taken by them in the experimental boring in Fort William, for the successful prosecution of which they have caused a supply of tubes and rods to be sent out; and directing a full report on the further progress of this interesting object of public utility. The following *memorandum* on the Society's report by the H. C. Inspector of military stores was appended.

Memorandum on the subject of Boring for water, with reference to the Report of a Committee appointed by the Asiatic Society of Calcutta upon experiments made at Fort William, for the purpose of obtaining a supply of potable water.

"In submitting a statement herewith, of the pipes, rods and tools for boring for water, now under supply for Bengal, in addition to the ten sets of boring apparatus provided upon the indent of 18th December, 1832, I beg to observe, that anticipating the objection made to the length of the rods formerly supplied to Bengal, viz. six feet, I had already caused those for the ten sets furnished upon the indent above mentioned, to be made in lengths of 10 feet each, and have now determined upon making the additional rods to be provided, in lengths of 20 feet, similar to those sent to Madras, and Bombay. If these lengths are found to be more generally useful than the old ones, the short rods which the Bengal Government at present possess, can easily be lengthened by cutting them in two, and welding in the centre of each a piece of the length required.

"As the screws of each description of rods are exactly similar in the thread, they may be used together, which will enable the operators to penetrate to any depth the soil, &c. will permit.

"With regard to the pipe, so necessary to the successful prosecution of the work, (and the want of which has been so much dwelt upon,) 1000 feet of cast iron pipe has been provided of the following interior dimensions, viz. 8 inch, 6 inch, and 4½ inch; which will admit of the one being passed through the other, but as it will not be necessary to use cast iron pipe the whole depth, sheet iron pipe (which can be readily made upon the spot of any size required) should be used wherever it may be practicable. Two lengths of these of 5½ inch diameter are sent as patterns.

"With regard to the alleged breakage of augers; the second page of the *Report of the Committee* appointed by the Asiatic Society, forwarded from Bengal, presents an abstract of the several experiments in boring: from which it would appear, that in no less than eleven instances the work was given up in consequence of the auger breaking, and in no one case the rod. I am inclined to think there must be some mistake in this, for from the formation of the auger it is scarcely possible to break it in the act of boring, it being stronger than the rod. In the seventh page of *Dr. Strong's Report*, allusion, however, is made to *two* instances in which the rods broke and remained in the ground; and in the ninth page, he again mentions, that the borer broke, and 91 feet of rod were lost. From this I infer, that in most of the instances of failure, it was the rod, and not the auger that broke; and that the accident would probably not have occurred, had

the jumper and drill been used before the auger; or if it had occurred, that the broken rod might have been extracted by means of a proper tool.

"The Diagram and plan alluded to in the Report, have not been forwarded to England, which is to be regretted.

"Upon the whole, it does not appear that the results of these experiments, to such extent as they have been carried, are at all discouraging, or that the failures attending their progress have been more than might have been expected, considering the defective knowledge of boring in the early stages of the operation at Calcutta, the deficiency of tools for piercing the various strata, and the want of pipes to prevent the falling in of sand, or the irruption of the land springs.

"The progressive improvement in carrying on the work, is evinced by the fact, that the same depth has of late been attained in six months, that formerly occupied two years. It may therefore reasonably be hoped, that upon being provided with further facilities, and such tools as experience in this country has shewn to be necessary, the undertaking if vigorously prosecuted will eventually be crowned with success.

(Signed) "J. T. BONNER, *Inspector*."

A letter from Major J. COLVIN, Engineers, dated 11th April, 1835, announced the dispatch of six chests of fossils from the lower hills, in furtherance of his promise to present the result of his labors to the Society's Museum.

[These will be noticed further on arrival.]

A letter from Conductor DAWE, Delhi Canal Department, dated 17th April, noticed the discovery of a fossil Buffalo's head of large dimension, found in the vicinity of the Haripur pass, in the lower range of hills. A sketch accompanied, and Mr. DAWE expressed his willingness to present the specimen itself to the Society.—Accepted with thanks.

A Memoir on the strata and formation of the alluvium of the Jamna and Doab, with numerous drawings and sections, was received from Sergeant DEAN, in illustration of the series of specimens presented in his name at the last Meeting.

[This paper will be published in an early number.]

Further observations on the moon's influence on rain were submitted by the Rev. R. EVEREST.

J. T. PEARSON brought forward a motion to the following purport:

"That the committee of papers be requested to consider the propriety of admitting a new order of members into the Society, to be called *Associate Members of the Asiatic Society*, and to consider upon the terms of their admission."

The object of this resolution, he explained, was to obtain the assistance of many scientific men who were now prevented from joining the Society by their inability to pay the quarterly subscriptions. The dignity of Honorary Membership should be reserved for those distinguished orientalists out of India whose contributions to our Transactions or our Library, or whose successful promotion of the objects of the Asiatic Society, should merit such a reward. The grade of *associates* would merely imply admission to all the privileges of ordinary paying members, conferred upon those whose labours would be valuable in their respective departments, and who were unable to pay. It was so understood in the Linnean Society, which derived material aid from its associate members.

The resolution was seconded by Mr. W. H. MACNAGHTEN and adopted by the meeting.

The Secretary called the attention of the Society to the late important resolution of the Government, suspending the printing of all the Oriental works hitherto in the course of publication under the auspices of the General Committee of Public Instruction.

He had ventured to bring forward a motion on the subject at the last meeting, but had withdrawn it, under the impression that it was premature, and that

Government might be induced to reconsider the effect of such a measure. He however now held in his hand a copy of the order to the Printers, directing them to discontinue all the works in hand (with one exception), and to dismiss the establishment hitherto entertained for the transcription and collation of MSS., and for the correction of the Sanscrit and Arabic Press.

The principal Sanscrit works thus consigned to sudden destruction were:

1st. The *Mahábhárata*, expected to form five quarto volumes, and printed nearly to the middle of the 2nd volume, 1400 pp., or little more than one-third of the work.

2nd. The *Rájatarangini*, comprising one quarto volume of 620 pages, of which about 200 remain to be printed.

3rd. The *Naishada*; of this 600 pages or rather more than one-third have been executed.

4th. The *Susruta*, to occupy 2 vols. royal octavo. Of these 714 pages, forming the first volume, and three-fourths of the second, are already printed.

5th. The *Sarirak vidya*, a translation of an English work on Anatomy into Sanscrit, of which 20 pages remain unprinted.

Of Arabic works, the order of Government will extend to

6th. The *Fatáwa Alemgíri*, of which one-half of the sixth and last volume, only, is deficient. (The Committee of Education have however recommended this work to be completed.)

7th. The *Khazánat al Ilm*, a valuable exposé of European mathematics in Persian, of which 500 pages are printed, and 106 remain.

8th. The *Ináya*, of which the last two volumes are printed, and 450 pages of the second volume. 150 pages of the latter, and the whole of the first volume (of which a correct manuscript has with great difficulty been obtained), remain to be printed.

9th A treatise on Algebra by Dr. MILL, proceeding on the basis of a translation of Bridge's Treatise, but much modified and enlarged; with an Appendix on the application of analysis to geometry and trigonometry. The two first parts to the end of plane trigonometry are finished: but a continuation of the Appendix to spherics remains to be passed through the press.

Many other works might be enumerated, particularly the translations into Arabic of HUTTON'S Mathematics, HOOPER'S Vademecum, and CROCKER'S Land Surveying, by Dr. JOHN TYTLER, which are left in an unfinished state. But prospectively, the interdiction extends to all the Oriental classics selected by the late Committee and by Mr. WILSON as eminently fit to be preserved in a printed form. The Rámáyana, and some of the Puránas; the Mugdhabodha, with commentary, and other works on Grammar; various standard treatises on Law, Rhetoric, and Logic; and eventually, the Vedas themselves:—also the standard Bauddha works in Sanscrit brought to light by Mr. HODGSON*; the Surya Siddhánta, and the works of BHA'SKAR A'CHA'RYA, urgently recommended for publication by Mr. WILKINSON; and a vast number of others which might have been gradually undertaken as the means of the Committee should permit.

Without entering into any discussion as to the propriety of the measure as regarded the great object of Education, he deemed it his duty as Secretary to bring to the notice of the Society a resolution fraught with such destructive results to the ancient literature of the country, and opposed so sternly to the interests and objects of the Asiatic Society, which seemed called upon not only to remonstrate, but in every way to exert its influence to save the venerable fabric of Indian literature from such a catastrophe, and to reseue our national character from the stigma of so unjust, unpopular, and impolitic an act, which was not

* A friend has pointed out to me the following passage of a letter published by Lieut. WEBB in a Calcutta periodical in the year 1823.

"You are yet all in the dark, and will remain so, until you have explored the grand libraries of Patan, a city in Rájputána—and Jesselmere, a town north-west of Joudpur—and Cambay; together with the travelling libraries of the Jain bishops. These contain tens of thousands of volumes, and I have endeavoured to open the eyes of some scholars here on the subject. At Jesselmere are the original books of Bhauda (Buddha), the Sybilline volumes which none dare even handle. Until all these have been examined, let us declare our ignorance of Hindu literature, for we have only gleaned in the field contaminated by conquest, and where no genuine record could be hoped for."

far outdone by the destruction of the Alexandrine library itself! But it could not be supposed, that the Government of a great country could mean to withdraw its support and patronage altogether from the indigenous literature of India, however it might have determined to separate this object from the business of the Committee of Public Instruction, and to confine the efforts and the funds of the latter to the support and superintendence of schools and purely normal education. It only required a public body, independent of such functions, and offering a guarantee of competency for the task, to step forward and solicit to be entrusted by the Government with this momentous object. None could so properly proffer its services as the Asiatic Society, supported by all the eminent Orientalists of the country: he had already the assurance of many both in Calcutta and in the interior, that they would cordially join. He would then move the following resolutions:

"1st. That a Committee be formed in the Asiatic Society, to be called the "Oriental Publication Committee," consisting of the President, Vice-Presidents, and Secretaries as ex-officio members, and of such members as may express a desire to join it; as well as of all distinguished Oriental scholars, or patrons of Oriental literature, Europeans or natives, resident in India, who not being members of the Asiatic Society may be desirous of joining in the objects of the Committee.

2nd. That the Governor General be requested to accept the office of Patron.

3rd. That no monthly contribution shall be expected from ordinary or from associated members, but that subscriptions for specific objects may be occasionally invited, as may be determined on in committee.

4th. That the principal object of the Association is the completion of the publication of those Oriental works which have been hitherto printed under the auspices of the Committee of Public Instruction; but which, by a late resolution of Government, have been suspended, in order that the funds devoted thereto, might be wholly appropriated for purposes of Education by means of the English language.

5th. That the Asiatic Society do present an humble but urgent Memorial to the Government of India, or if necessary, to the Court of Directors, setting forth the great national importance of continuing the publication of the series of Oriental classical literature it had commenced; the high value set upon this undertaking by all the learned of Europe; the difficulty of re-organizing the same establishment, or one equally well trained for conducting through the Press any Sanscrit or Arabic works, if the Pandits, Maulavís, and compositors now employed be discharged and dispersed;—and soliciting, therefore, that the Government will still continue its patronage to these Oriental works, granting as a separate boon a sum of money equivalent to what has hitherto been expended, or such sum as may be sufficient for the object, and placing its expenditure under the Asiatic Society, or the Oriental Committee, with such means of audit or control as may seem advisable, to prevent misappropriation.

6th. That the Society will engage to devote its attention gratuitously to the careful and creditable execution of the important charge entrusted to it.

7th. That it will bring to the notice of Government other works which are worthy of being printed, and use its utmost exertion to secure the careful collation of manuscripts and correction of the press.

8th. That it requests of Government the same advantages as the Committee of Education has hitherto enjoyed for this purpose, in the use of the Pandits and Maulavís of the Pátsálá and Madrassá.

9th. That the Oriental Translation Branch of the Royal Asiatic Society of Great Britain be invited to unite with the Committee, as far as they have a common object in view, namely, that of placing in a permanent form the ancient classical literature of the country—by the printing of standard editions, with or without translations in the English or Latin language. That to that end the Oriental Fund Branch Committee of Calcutta might properly merge into the new Association."

The Secretary concluded by reading a letter from Mr. HODGSON, Resident in Nipal, whose experience of the natives, and acquaintance with Bauddha and Brahminical literature, entitled his opinions to the utmost respect. [We may perhaps find room hereafter for the insertion of this letter at length.]

Mr. W. H. MACNAGHTEN thought it would be useless in the Society to form a Committee, until it were assured that Government would grant the same pecuniary support as heretofore, or at any rate, a sufficient aid; he would therefore first propose that a memorial should be presented to Government, or if necessary, to the Court of Directors, expressing the sentiments of the Society as a body, on the late resolution, and praying to be allowed to continue the suspended publications at the public expence, in case no other arrangement was contemplated for their completion.

His own view of the effects of the measure on the education of the people, he had expressed in another place—but he could not consent to relinquish these arguments in an appeal from the Society, which was as much as any body open to conviction that the improvement of the vernacular dialects, nay the very grammatical formation of them, required the cultivation and preservation of the parent and classical languages.

The Rev. Dr. MILL entirely concurred in these views. To discourage systematically the study of the learned languages of the east,—was, as far as in us lies, to barbarize the native dialects, and render them incapable of being the vehicles of science and improved knowledge. This capability was now eminently possessed by many of them, entirely through their natural connexion with the Sanscrit, an advantage which it was chimerical to think of supplying by means of artificial and exotic derivation from the English. Another observation had forcibly struck him with respect to the late measure. There were *two* distinct classes of publications overthrown by it, of which he feared only one would or could be provided for by the Society's proposal; namely, the perpetuation of the most venerated monuments of Sanscrit, Arabic, or other oriental literature,—but the other class, comprising the 5th, 7th, 8th, and 9th of the works enumerated above, which are intended to communicate the advanced knowledge and science of Europe, through the medium of the learned languages of India, either by translations or original treatises, and thus indirectly, but most powerfully, to encourage the study of English among learned natives, fell peculiarly under the scope of an Education Committee. It did not come within the Asiatic Society's province to attempt this, otherwise than by commenting on existing native systems of science; and although the object was so important as to warrant some latitude in the exercise of its proposed functions, it seemed doubtful whether they could properly undertake the completion of the four works thus suspended, already prepared and half printed at so great an expence.

Mr. TREVELYAN came purposely to support the formation of the new Committee. He thought the preservation of standard editions of the classics of the country a national object, although he had done his utmost to disconnect it from the business of national instruction. He had himself had a narrow escape of being a great orientalist, for he had attained some credit for his progress in Sanscrit at College: but his Dictionary fell overboard on his voyage to this country, and thus he was saved from the bias which an enthusiastic devotion to this ancient tongue might have given to his views of education.

The PRESIDENT thought, it would be proper to confine the object of the Society's motion, to the simple question of the completion of the oriental works, which it was given to understand had been discontinued. He also agreed with Mr. MACNAGHTEN, that the first step must be to ascertain whether Government would continue its support, and to what extent; for this he recommended, that Mr. MACNAGHTEN and Dr. MILL should be requested, in conjunction with the Secretaries, Mr. J. PRINSEP and Bábu RAM KOMEL SEN, to draw up an urgent memorial to the Government, avoiding to the utmost all controversial points, and to submit it for the approval of the Society at the next meeting.

This proposition was unanimously agreed to.

[The meeting was less numerously attended than usual, in consequence of the usual notices to members having been omitted. At the last meeting it was directed, "that in future the day of meeting should be fixed regularly for the first Wednesday of every month, and that notice should be only inserted in the "public engagement" column of the daily papers."]

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of April, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.						Register Thermometer Extremes.		Rain, inches.	Wind.			Weather.		
	Standard Barometer at 32°.	Wet Barometer, do.	Ags. Ten. deduced.	Ther. in air.	Diff. or M. T. Depress.	Leslie's dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Ags. Ten. deduced.	Thermometer in air.	Different.	Leslie's dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	Evening.
1	29,014	8,896	1,118	82,4	6,7	13,0	73	,860	,572	1,289	86,9	19,3	19,1	59	63,0	131,5		W.	NW.	sw.	haze.	fine.	clear.
2	,971	,812	1,159	83,6	5,2	11,4	80	,960	,490	1,370	88,7	20,6	20,4	60	63,7	131,5		o.	sw.	w.	fog.	clear.	do
3	,906	,880	1,116	82,3	10,0	9,0	88	,899	,498	1,401	89,4	19,8	20,2	63	66,5	132,7		S.	sw.	sw.	clear.	do	hazy.
4	,968	,788	1,180	84,4	7,6	6,7	92	,892	,498	1,394	89,7	18,7	19,7	68	70,4	115,1		S.	sw.	sw.	do	hazy.	do
5	,936	,783	1,175	84,7	7,7	6,2	92	,812	,475	1,337	88,0	12,7	13,3	82	73,0	109,2		S.	S.	S.	scud.	cum.	do
6	,920	,714	1,206	85,0	8,2	8,6	91	,738	,411	1,327	88,2	10,9	11,2	85	73,1	104,0	0.10	S.	S.	S.	cum.	cloudy.	cloudy.
7	....	....	....	....	....	....	..	,809	,557	1,252	86,1	8,0	8,5	90	68,2	92,0	0.15	S.	S.	S.	do	do	cumuli.
8	,961	,928	1,033	80,7	6,4	6,2	93	,810	,620	1,190	83,4	7,4	6,2	92	64,2	106,2		n.	n.	se.	hd. rn.	cum. cir.	fine.
9	,887	,750	1,137	83,1	4,5	4,0	96	,737	,397	1,340	87,1	9,7	9,0	87	66,0	121,2		se.	s.	sw.	fog.	cum.	cumuli.
10	,908	,737	1,171	83,6	5,4	6,0	92	,772	,430	1,342	87,8	10,8	9,8	81	73,2	129,8		s.	s.	sw.	do	fair.	do
11	,882	,632	1,250	85,8	6,8	5,5	92	,764	,400	1,364	88,7	12,0	12,5	82	73,1	123,6		S.	s.	s.	clear.	do	clear.
12	....	....	....	....	....	....	..	....	....	....	....	....	....	..	73,0	126,2		SW.	S.	s.	cirri.	do	do
13	,822	,582	1,240	85,9	8,2	8,5	93	,729	,216	1,513	89,9	16,7	16,4	74	75,0	136,8		sw.	sw.	S.	haze.	clear.	misty.
14	,879	,610	1,269	86,3	9,7	10,1	85	,799	,212	1,567	91,0	23,4	22,6	54	76,1	133,0		s.	W.	w.	clear.	fine.	fair.
15	,838	,598	1,240	86,6	8,7	8,9	89	,721	,272	1,449	90,0	21,6	21,0	58	79,2	137,2		nc.	sw.	W.	do	clear.	do
16	,768	,398	1,370	89,3	13,0	12,7	82	,654	,245	1,409	92,7	11,9	12,8	82	74,5	130,0		s.	sw.	S.	do	fine.	fine.
17	....	....	....	....	....	....	..	....	....	....	....	....	....	..	75,7	120,0		S.	S.		do	do	do
18	,770	,437	1,333	87,4	7,6	7,1	93	,643	,249	1,394	90,3	8,6	8,5	91	76,8	110,0		S.	S.	s.	cum. str.	gale.	do
19	....	....	....	....	....	....	..	....	....	....	....	....	....	..	78,5	105,2		s.			do	do	
20	,758	,430	1,328	87,3	8,1	7,7	92	,604	,226	1,378	89,3	8,3	9,0	90	77,2	91,0	1.00	S.	S.	s.	do	do	threat'ning.
21	,849	,622	1,227	84,3	6,1	5,2	94	,691	,458	1,233	85,8	5,0	5,9	96	69,0	91,5		S.	sw.	s.	do	cloudy.	fine.
22	,834	,615	1,219	85,0	5,6	4,9	96	,721	,378	1,243	88,6	10,2	10,5	83	75,2	110,8		S.	W.	nw.	overcast.	clear.	do
23	,872	,808	1,064	82,3	7,0	5,5	95	,784	,573	1,211	84,4	5,9	6,6	94	66,5	102,0	0.95	e.	E.	sw.	do	rain.	cumuli.
24	,838	,700	1,138	82,9	7,7	6,4	93	,710	,421	1,289	86,1	12,2	12,2	80	69,5	121,0		se.	w.	w.	cirri.	clear.	clear.
25	,794	,648	1,146	83,9	6,8	6,0	94	,637	,264	1,373	88,3	13,2	12,6	78	73,0	125,0		sw.	sw.	sw.	clear.	do	cloudy.
26																							
27	,890	,690	1,200	83,9	9,0	8,0	89	,754	,539	1,215	84,9	7,4	8,1	89	.....	.....	0.05	.....	nw.	se.	....	drizzle.	overcast.
28	,858	,670	1,188	83,8	7,6	7,3	91	,729	,399	1,330	88,1	9,8	9,8	86	.....	.....		.....	w.	w.	....	fair.	cumuli.
29	,826	,648	1,178	84,0	7,6	6,2	93	....	....	....	....	....	....	..	.....	.....		.....	se.	s.	....	drizzle.	do
30	,798	,554	1,254	85,4	7,7	7,0	92	,672	,190	1,482	90,4	13,1	13,0	79	.....	.....		.....	sw.	sw.	....	clear.	do
Mean,	,874	,677	1,198	84,6	7,6	7,6	90	,752	,400	1,348	88,1	12,7	12,7	79	71,4	117,7	2·25	southerly.			north-westers in the evening.		

The instruments the same and situated as usual.

A second opportunity of comparing the Assay Office Barometer with the standard instrument of the Royal Society of London has been furnished by the careful comparison of Sir Edward Ryan's Barometer with that of Sir J. Herschel at the Cape observatory. The result is that my Barometer stands 0·007 *too high*. The former comparison (see Met. Reg. Nov. 1834) made it 0·010 *too low*. The mean shews as near an accordance between the two instruments as could be desired.—J. P.

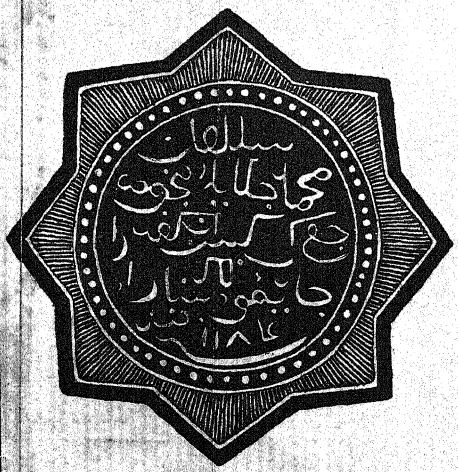
1

Seal of the present Sultan of Johore or Singapoor

2

Present Eang deper Tuan Muda of Rumbowe

3



Present Rája dhi Rája of Sungie Oojong

4

Present Eang deper Tuan Besar of Rumbowe

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 41.—*May*, 1835.

I.—*Sketch of the four Menángkábowe States, in the interior of the Malayan Peninsula. By Lieut.* J. T. NEWBOLD, *23rd Regt. Madras Native Infantry.*

[See Proceedings of the Asiatic Society, 11th March, 1835.]

THE inhabitants of the states in the interior of the southerly part of the Malayan Peninsula, particularly those of *Súngie-újong*, or *Simújong*, *Rambowe*, *Johole*, and *Sríminánti*, derive their origin from the parent empire of *Menángkábowe*, in Sumatra, more directly, than the natives of the neighbouring states. This peculiarity, with respect to Rambowe alone, has been cursorily noticed by Mr. MARSDEN and Sir STAMFORD RAFFLES. The former, quoting the Transactions of the Batavian Society, observes, that the interior boundaries of the Malacca territory are "the mountains of Rambowe, inhabited by a Malayan people named *Menángkábowe*; and Mount Ophir, called by the natives *Ganong Ledáng*. These limits, say they, it is impracticable for an European to pass; the whole coast for some leagues from the sea being either a morass or impenetrable forest; and these natural difficulties are aggravated by the treacherous and blood-thirsty character of the natives." If we give the author of this unpropitious account due credit for veracity, we must, in justice to the Menángkábowes, and the tract they inhabit, acknowledge at the same time that the progress of civilization has been rapid, and the change in the face of their country corresponding.

The forests are, at the present time, certainly thick, and some of the morasses deep; but during a recent ascent to the summit of Mount Ophir, and a journey along the foot of the Rambowe mountains, I found neither the one nor the other impenetrable or impracticable, and experienced nothing but kindness and hospitality from the natives.

Sir S. RAFFLES, in a letter to Mr. MARSDEN, thus notices the state of Rambowe: "Inland of Malacca, about sixty miles, is situated the Malay kingdom of Rambowe, whose Sultán, and all the principal officers of state, hold their authority immediately from Menángkábowe, and have written commissions for their respective offices. This shews the extent of that ancient power, even now reduced as it must be in common with that of the Malay people in general. I had many opportunities of communicating with the natives of Rambowe, and they have clearly a peculiar dialect, resembling exactly what you mention of substituting the final *o* for *a*, as in the word *Ambo* for *Amba*. In fact, the dialect is called by the Malacca people the language of Menangkabowe."

The foregoing remarks apply equally to the three vicinal states, Súngie-újong, Johole, and Sríminánti, and as has been already observed, to Náning. It is also worthy of remark, that in the ancient records of the Dutch, preserved in the archives of Malacca, the natives of Rambowe and Náning are invariably styled "Menángkábowes."

The period when these colonies, from the heart of Sumatra, settled in the interior of the peninsula, is unknown. It is generally admitted, that Singapore and the extremity of the Peninsula were peopled by a colony from Sumatra in the middle of the twelfth century, by the descendants of which Malacca was founded nearly a century subsequent; as well as other places on the sea-coast, as Perak, Quedah, Pahang, Tringano, &c.

Antecedent to this, according to the best native information, the coasts of the peninsula and adjacent islands were inhabited, though thinly, by a savage race, still known under the name of *Ráyet Laut*, (subjects of the sea,) the Icthyopophagi of the ancients, and termed by VALENTYN, probably from their situation, "Cellátes." The interior was peopled by those singular aborigines, the *Ráyet Utan*, (subjects of the forest,) of whom there are various tribes. Those that have hitherto fallen under my observation have all borne the Mongol stamp on their features; though the *Sémang* in the interior of Quedah is said to be characterized by the woolly hair and thick lips, &c. of the Papúan.

Tradition ascribes the peopling of the interior of the peninsula by the Menángkábowes to a more recent and direct emigration from Sumatra than the one above alluded to. In absence of all historical information, the following story, as current among the better informed descendants of this colony, may perhaps not be out of place.

"After SRI ISCANDER SHAH had fled from Singhapura to Malacca, in the seventh century of the Hejira, a Menangkabowe chief, named *Tú Pattair*, came over to Malacca attended by a numerous retinue.

He ascended the river to Naning, where he found no other inhabitants than the Jacoons, (a tribe of the *Ráyet Utan)*, and settled at Taboo and took to wife one of the Jacoon damsels; an example speedily followed by his vassals. This little colony gradually spread itself over Súngie-újong, Rambowe, Johole, and other places, chiefly inhabited by the aborigines, (who gradually betook themselves to the woods and mountains, as the intruders encroached,) viz. Jompole, Sérling, Jellabú, Srímináti, and Terachi.

In course, of time, Tu Pattair died, and was buried at Lúbo Koppong, in Náning, where his tomb is to this day venerated as a *Krámet*. From these accounts then it would appear, that the present inhabitants of the interior of the part of the peninsula here spoken of, are chiefly descendants from the Menángkábowes and Jacoons; and those on its coasts, from the Malays who fled from Singhapura, and the *Ráyet Laut*.

The new settlers, rapidly increasing in numbers, divided themselves into nine petty states, under as many *Panghúlus* or chiefs, feudal to the Malayan Sultáns of Malacca, and after their expulsion by European powers, to those of Johore, by whom they were consolidated under the name of the *Négri Sambílan*, or the nine territories.

The names of these states, and the titles bestowed on their chiefs by the Sultáns of Johore, are as follow, viz. Segámet, under ORANG KAYU MU'DA; Johole, JOHAN LE'LAH PERCASSEH; Náning, Mahárájá LE'LAH; Súngie-újong, KLANA PU'TRA; Jellabú, AKHIR ZEMA'N; Rambowe, LE'LAH Mahárájá; Cálang or Salengore, TU'NKU CALANG, Ulu Paháng, including Serting and Jompole, Rájá ANDRA SEKA'RA, and Jellye, under *Mahárájá* PU'RBA.

These titles were hereditary, and their possessors used to present themselves (Mengádap) once a year at the court of Johore.

In a manuscript collection of treaties made by the Dutch in the east, are found contracts principally of a friendly and commercial character, with Rambowe and the *Négri Sambílan*, from 1646 down to 1759. Prior to this period, the Dutch had assumed considerable influence over the nine *Négris:* and, with the formal consent of the king of Johore, Sultán ABDUL JALIL SHAH elected a Bugis prince, named DYEN CAMBODIA, as chief over the whole nine. Náning had long fallen into the hands of the European Government at Malacca, and Srímináti rising into importance, tacitly assumed its place among the nine *Négris*.

The Menángkábowes, disgusted with the arbitrary proceedings of their Bugis ruler, invited over one of the princes of the blood royal of Menángkábowe from Sumatra, named Rájá MALAYWAR. The *Panghúlus* of Súngie-újong, Rambowe, Johole, and Srímináti espoused

the cause of the latter, whilst the five remaining states took up arms in favor of the former.

The Dutch, it would appear from an official communication addressed to the Panghúlu of Náning, in answer to a requisition made by that chief for ammunition to defend himself against the Bugis, did not take any active part in these disturbances, but pithily advised the *Panghúlu* to observe a state of neutrality, and in no case whatever to intermeddle with such intestine commotions; and refusing the supply of ammunition solicited, informed him that, being a subject of the Mátschappy, he had not the slightest cause for fear.

In the event, the Menángkábowe claimant, Rájá MALAYWAR, was successful, and DYEN CAMBODIA retired to Rhio, where he died about 1773.

The *Panghúlus* of the four states, which had espoused his cause, with the assent of the Sultán of Johore, and the government at Malacca, elected Rájá MALAYWAR as their sovereign, under the title of *Eang depertúan Besár**, renouncing at the same time their allegiance to Johore.

Rájá MALAYWAR was the first prince of the Menángkábowe dynasty in the interior.

The five other states remained as before, feudal to Johore.

The following stipulations, a copy of which is said to be in possession of the chief of Sríminánti, were then agreed on: viz. that the Menangkabowe sovereign, on all affairs of state, should assemble the four *Panghúlus*, and should submit to a majority; that his maintenance should be supplied equally by the inhabitants of the four states, each house contributing annually one gantam of rice, two cocoa-nuts, and one *súku*.

The *Panghúlus* bound themselves to furnish a certain complement of men, arms, ammunition, and provisions, in case of a war; also on occasions of deaths, marriages, circumcision, &c. in the royal family, to send, each of them, three head of buffaloes, and to distribute a certain sum in *sadkeh* (alms).

The instalment of the *Eang depertúan Besár* devolved upon the four *Panghúlus*, hence termed *Punghúlu Defántye*.

To them also, on the decease of their sovereign, fell the duty of transmitting the news of the event by letter to the Rájá of Menángkábowe, who on its receipt deputed one of the princes of his house, with pompous credentials†, viâ Siac, Malacca, and Náning, to Ram-

* The title assumed by Menángkábowe princes of the blood.

† A translation of these credentials is annexed: they bear a strong resemblance to the Menángkábowe document published by Mr. MARSDEN.

bowe, where he was met and crowned in state by the four *Panghúlu Defántye*. Hence Rambowe is termed *tánnah kréjan*.

From thence the newly elected prince proceeded to his *astánah*, or palace, at Sríminánti, which is the royal burial place, and also called *tánnah mengándong*.

Peculiar *Báleis* are elected by the *Panghúlus* in their respective territories, for the reception of their feudal chief, the shape and fashion of which it would be deemed high treason, *Angkára Mahárájá Lélah*, to alter.

That at Súngie-újong is called *Bálei Melínátong*, from the circumstance of its being built at right angles with the river; and that at Johole, *Bálei Bertínkat*, having two stories.

The revenue of the four *Panghúlus* is derived from the power they possess in the states under their sway, of inflicting fines and levying discretionary contributions, enforcing gratuitous labour, &c. The levying of the tenth on the crops is not in general usage.

The real power is monopolized by them, that possessed by the *Eang departúan Besár*, being only nominal, and depending on opinion.

On the decease of the first deputed prince, from Menángkábowe, Rájá Malaywar, Rájá Adil was nominated by his father, the reigning sovereign in Menangkabowe, as his successor; and having arrived at Rambowe, was there duly installed.

Rájá Adil died in 1795 or 6, leaving three children, Rájá Assil, Rájá Sabun, and Tuanku Putri, a daughter. He was succeeded by Rájá Itam, also deputed from Menángkábowe; and Rájá Assil, eldest son of the deceased Rájá Adil, became the first *Eang depertúan Múda*. This innovation was made with the concurrence of the four *Panghúlus*.

Rájá Itam died in 1808, succeeded by Rájá Li'ngang Laut, who was the fourth deputed prince from Menángkábowe.

In 1812, Rájá Hadji, one of the sons of the *Eang depertúan Múda*, Rájá Assil, carried off by force his sister-in-law, in consequence of the *Panghúlu* of Rambowe's refusing his consent to their marriage on the ground of its illegality. A war ensued, in which the *Eang depertúan Múda*, Rájá Assil, who had sheltered the fugitive couple at Sríminánti, took an active and decided part in their defence against the *Panghúlu* and *Ampat Súka* of Rambowe. The latter then sent to request the co-operation of Rájá Ali*. This notorious chief, whose life

* Rájá Ali is about 50 years of age, low in stature, dark in complexion, of a forbidding and rather ferocious aspect; negligent in dress and person; grossly ignorant and superstitious: though, for a full enjoyment of the drug opium, he would willingly relinquish his hopes of the *Jannat al Firdous*, in the seventh hea-

has been passed in feuds and bloodshed, and whose ambition has since elevated him to the dignity of the *Eang depertúan Besár*, was the son of the wife of the Menángkábowe prince Rájá ITAM, by her former husband, Rájá HAMAN, brother of Sultán IBRAHIM, late Rájá of Salengore. Rájá ALI's mother is the daughter of the second deputed prince from Menángkábowe.

Rájá ALI, who had fled to a place called Súngie Nípah, beyond Cape Rachado in Salengore, lent a ready ear to this proposition, and repaired to Rambowe, accompanied and supported by the *Dattu Múda* of Lingie. His weight turned the scale of events, and the *Eang depertúan Múda*, Rájá ASSIL, after some fruitful efforts at negotiation, retired to Náning (1813), and eventually to Malacca (1814), where he appealed to the then British Resident, Colonel FARQUHAR; nothing however favorable to his cause resulted.

Having obtained a private loan of 2,000 dollars in Malacca, he again proceeded to Rambowe, but failing, retreated to Náning, where he died shortly afterwards (1814-15); and was interred at the green knoll on which stood the mosque of Búkit Tútu, near Alor Gájeh.

He left four sons and two daughters.

Rájá ALI, this obstacle to his ambition being removed, was elected as *Eang depertúan Múda*, under the *Eang depertúan Besár* LINGANG LAUT who died in 1824, leaving two sons, Rájá RADIN, of *Sríminánti* and Rájá U'JONG; both by his wife, the daughter of the Rájá of Jillabú.

In consequence of intrigues and dissensions among the four elective chiefs, artfully fomented by Rájá ALI, a successor was not appointed until 1826, when Rájá LABU, a son of the Rájá of Menángkábowe, bearing the ancient credentials from his father, and a letter from the chief of Siac, arrived.

He was preceded by an adherent named Rájá KRE'JAN, and having presented his documents at Malacca, went up to Náning. From thence, escorted by the chief of that place, the present *ex-Panghúlu*, he repaired to Rambowe, where he was installed according to custom. He married with TUANKU ITAM, daughter of the late *Túan Múda*, Rájá ASSIL, and proceeded to his *astánah* in Sríminánti.

ven, with all its black-eyed hourís. In disposition, he is crafty and determined; taciturn and deliberate in council; but prompt and decided in action—qualities of which I had opportunities of judging during a recent struggle between the Rambowe and Lingie chiefs. These, added to his high connexions, which however were not sufficient to give him a lawful title to the eminence which he has attained, mainly contributed to his success.

In 1830, in consequence of his countenancing the licentious proceedings of his follower, Rájá KREJAN, and the intrigues of his wife; and above all from the ambitious machinations of Rájá ALI, he was compelled to quit Sríminánti, but shortly afterwards, having gained over to his cause three out of the four elective *Panghúlus*, viz. those of Johole, Sríminánti, and Súngie-újong, as also the chief of Jompole, besieged Rájá ALI, in his mud fort of Bander in Rambowe.

Rájá ALI held out resolutely against the formidable confederacy; till at length, through the pacific mediation of the *Panghúlu* of Naning, after having lost one of their principal leaders, who was killed by a cannon shot from one of the old iron guns on the fort, they withdrew their vassals, and retired to their respective states.

Rájá ALI, his son-in-law, SYED SABAN, and Rájá RADIN, of Sríminánti, shortly after this seized on an opportunity afforded them by the absence of the *Eang depertúan Besár* at Súngie-újong, of surprising Sríminánti, and repossessing themselves of the guns which Rájá LABU had formerly taken from RADIN, under the pretext of their forming part of his regalia *(Kabesáran.)*

When tidings of this reached Rájá LABU, he marched, supported by the *Panghúlu* of Súngie-újong, KLANA KAWAL, against Rambowe; but in consequence, it is said, of some horrid cruelties perpetrated upon a female by some of their followers, they were deserted nearly to a man.

Rájá LABU did not advance further than Náning: whence, after a short stay, he went down to Malacca, and finally, in 1832, recrossed the Straits to Sumatra. His adherent, Rájá KREJAN, fled to Paháng, and thence to Múar, and finally, to Johole, where he is now engaged in fruitless intrigues.

He assisted the *ex-Panghúlu* of Naning during his rebellion against Government.

Such is the origin and decline of the Menángkábowe dynasty in the interior of the peninsula.

Rájá ALI was elected as the *Eang depertúan Besár* over the four states, and his son-in-law, SHERIF SYED SAABAN, as *Eang depertúan Múda* of Rambowe at Bander, on the 13th September, 1832.

The question of succession still remains unsettled: among the elective *Panghúlus*, great discordance of opinion prevails, arising principally from the premature and impolitic revival of old but contested rights appertaining to their titles by Rájá ALI and SYED SAABAN. This has led to rebellion, and the strangulation of the tin trade in Súngie-újong; and to bloodshed and disturbances on the banks of the Lingie river, unadjusted at the present moment.

An innate antipathy to innovation, and a secret wish to revert to the Menángkábowe dynasty, prevails more or less throughout the four states, and in case of the demise of RÁJÁ ALI, if not previously, a severe struggle may be expected between the partizans of the *Eang departúan Múda*, SYAD SAABAN, on the one hand, and the advocates for the *addat dhaulu*, or ancient custom, on the other.

SYED SAABAN, by no means insensible that in this case, the best way to secure an advantageous peace is to prepare betimes and vigorously for war, has been for some time past actively engaged in strengthening Sémpang, a post advantageously situated on the apex of the delta, formed by the junction of the Lingie and Rambowe streams, and about six miles from their debouchément into the sea. Here he has lately been joined by a chief from Sumatra, with a numerous train of followers.

APPENDIX.

Translation of the Credentials called the Tromba Menángkábowe تورمبا منغكابو *brought over from Sumatra by the last deputed prince Rájá* LAB'U.

The seals at the top are placed from the right to left, according to the order of precedence of the princes whose titles they bear; all feudal to Menángkábowe.

According to the etiquette of Malay letter writing, the "place of honour," for the impression of the seal, is about the commencement of the epistle, to its extreme right, and on the highest *Mistar*. In letters from a subject to a sovereign, the impression is made near the foot.

6	5	4	3	2	1
Sultán Rájá Magat, from Rogum, son of the Eang depertúan of Paggaruyong.	Sultán Berkumbah Puteh, from Sungie Paku, the son of, &c.	Sultán of Indraghiri, Sulta'n Sri Kahil, son of, &c.	Sulta'n of Jambie, entitled Baghinda Tuan, son of, &c.	Sultán of Palembang, son of Sulta'n Indra Rahim, son of, &c.	The firm in faith, by the grace of Alla'h, the great Sulta'n Mahára'ja' dhirája, son of the deceased, Sulta'n Abdul Jalil Mua'zzem.
11	10	9	8	7	
Sulta'n Tuanku of Siac, son of, &c.	Sulta'n of Bintan, entitled Sulta'n Mohikat, son of, &c.	Sulta'n of Achin, entitled Sri Paduka Berpakat Rahim, son of, &c.	Sulta'n of Priamah, entitled Maha'ra'ja' son of, &c.	Sulta'n of Indra'pura, entitled Sulta'n Mahomed Sh ah, son of, &c.	The firm in faith, by the grace of Alla'h, the great Sulta'n Maha'ra'ja' dhira'ja', son of the deceased Sulta'n Abdul Jalil Mua'zzem.

2. Sultán Indrá Rahim was the first monarch of Palembang, and grand-father of the Eang depertúan Makat Denam, brother of Baghinda Abras.

3. Baghinda Tuan was the founder of the dynasty of Jambie, which extends to Chi Jambie, of nine districts.

4. Sultán Sri Kahil was the founder of the dynasty of Indrághiri, which extends to the sea.

5. Sultán Berkumpa Puteh was the founder of the dynasty of Súngie Pakú, which extends to Bandar Sapuloh.

6. Rájá Magat was the founder of the dynasty of Rogum, which extends to Kúri, in the Mampawa territory.

7. Sultán Mahomed Sháh was the founder of the dynasty of Indrápurá, which extends to Moco Moco.

8. Sultán Maháráját was the founder of the dynasty of Priáman, which extends to Tiko and Kakanuli.

9. Sri Paduka Berpakat was the founder of the dynasty of Achin, which extends to Telabu and Battu Barra.

10. Sultán Mohíkat was the founder of the dynasty of Bintan, extending to Batavia.

11. Sultán Suanku was the founder of the dynasty of Siac, which extends to Patta Pahan, to Pulo Sawan, and Kasang Bunga.

" Oh God, look down upon the greatest of Sultáns, prince of great men, the shadow of Allah in this world, renowned among Arabs and barbarians inhabiting this material world, (created for) the children of Adam : Oh Lord of the kings of the earth, it hath been declared in the Korán that every day and night is to be accounted as void of light, until the dawning of the true faith in the appearance of MUHAMMED SEYD-AL-MURSALIN, the last of the prophets. Amin ! Oh God of worlds.

The Almighty hath caused this firman to appear in the Korán in respect to princes, viz. " I have created man infinitely superior to the angels, the sun and the moon. I have given him sovereignty on earth. I have created genii and mankind, in order that they may worship me."

The Almighty caused the dry land called Púlo Langkáwi to descend between Palémbang and Jambie, as the place of residence for the original sovereigns of the world, viz. the descendants of Sultan HIDAYET ALLAH TA-ALA, whom he had brought down from the clouds.

Among these descendants was Rájá ISCANDER zer Alkurnein, whose country is Srang, and who is possessor of the iron lock intensely green ; sometimes assuming a red, sometimes a yellow, and sometimes a white hue ; and, in short, possessing all colours so vividly as to dazzle the eye of the beholder ; this forms part of the *kabesáran* (regalia) of the three royal brothers, who scatter profusely their justice and munificence to all the slaves of Allah, and to all princes who are feudal to them and derive favor and advancement from the beloved of Allah, MUHAMMED. These three Sultáns were very wise and faithful protectors of all the slaves of Allah.

It hath been declared that the fountain in paradise, *Jannat unnahim*, causes the young shoots to spring up from within the earth ; in like manner, the slaves of Allah exist by inhaling the fragrant odours emanating from the glorious *Bálie* (a sort of hall of audience) of their prince.

Odoriferous as ambergris and musk are the prosperity and power of the three royal brothers, viz. the Sultán of Rúm, Sri Maháráját

ALIF, the Sultán of China, Sri Mahárájá DEPANG, and the Sultán of the Golden Island, in the territory of Menangkabowe, Sri Mahárájá dhi Rájá BERDOULET. Amin, Oh God of worlds!

Whereas the following are declared to compose the *kabesáran* (regalia) of his majesty the lord of the state of Menangkábowe, viz. the diadem of the prophet SOLOMON: the web called *Songsang kála*, which weaves itself, a thread every year, until the completion of the duration of the world. The wood *Káyu Gámet*, which is divided into three portions, one of which is in the possession of the King of Rúm, the other in that of theKing of China, while the third remains with the King of Menangkabowe. The ratan termed *Mánno ghíri*, which erects itself. The *Párang* (chopper) of gold. The *Chongka Chongkye* (a tray with a pedestal). The mass* of gold, *Kédah Allah*, (lit. the tinder box of Allah,) resembling a man in shape. The gold *Jattah Jattí*, to be suspended across his shoulder. The tree *Naga*† *Tárin*, studded over with precious stones and rubies. The *Sépit*‡ *Pínang*, (betel-cutter,) *Kapála bára*, which performs its office spontaneously. The *Choie Siméndang ghíri*§, with one hundred and ninety notches, occasioned by the wounds it inflicted on the serpent *Sicatimána*. The mountain *Bongsyé*, from whence the Sultán ascends to the fiery mountain, and by whose supernatural influence the rivers which flow from it possess rocks of gold, and waters emitting odours delicious as those of flowers. The lance whose shaft is of the *Sággar sántan*. The spear called *Sambárah*, with a sheath of *Gárda* wood, on which is inscribed a passage from the Korán. The kus *Allang bára*. The mat composed of *Sálang* leaves, which is worn as an ornament to the head by Mahá RA'TE, but forbidden by Mahá RUNJUT, who were cotemporary with the origin of this country.

The elephant *Sacte*. The fresh-water sea extending a day's sail. The mountain emitting flames of its own accord, where grow the plaintive bambus, which entrap wild birds by the fascination of their melody. The petrified cotton. The *Gándang Valigúri* (a sort of drum). The *Gong jejátan*. The *Gong semándrang*, the sound of which reaches to the clouds.

* This mass of gold, according to the information of a native of Manangkabowe, was what remained after the making of the crown of one of the ancient princes of that empire.

† The *Nága Tárin* is supposed to be a tree transmuted into gold.

‡ This instrument is said to be endowed with the faculty of ascending the Areca trees, and cutting the nut without human assistance.

§ Vide Sejára Maláyu for an account of the combat which terminated by the serpent's being cut into three parts by the invincible sword of Sangsapurba, traditionally the descendant of ALEXANDER the Great, and founder of the dynasty of Menángkábowe.

The hall of audience *Bálie*, whose columns are of the *Selátang* (a species of lofty nettle), and the beams of *Lendang* root. The drum *Púllut pulut*, headed with the skins of lice. The horse *Sambaráni**.

The bell *Samédro Sámbang láte*, whose perfect sound from the left daily summons petitioners to the right of the imperial throne.

The buffalo *Sibénoang Sácti*. The cock *Bírang Sangunání*. The well *Sikatang*. The cocoanut *Níra Bálie*. The black *Sanghúdi*, which is produced spontaneously. The paddi, *Sitanjo Báni*, on which his majesty the Eang depertúan feeds at mid-day. The paddi called *Sarámpun déndam kamára*. The flower *Srí*, the odour of which extends a day's journey; it is sown, grows up, produces leaves, flowers and brings forth fruit in the space of a single day, and the azure *Champaka*.

Such form the *Sabesáran* of the *Eang depertúan* of Menángkábowe, the Sultán who reposes cradled in the east, and on whose arising from slumber the *noubet* is sounded. The Caliph of Allah, his majesty the *Eang depertúan Sáti*.

These are the credentials of the beloved grandson of the *Eang depertúan* of Paggarúyong.

The bearer of this friendly document must be assisted and well entreated both by sea and land whenever encountered; for the High God hath said, "First set your trust on me, next on MUHAMMED and doubt not."

Do ye, therefore, all our children and grand-children, noblemen, merchants, and nakhodas, agree in standing by and upholding our ancient usages, which have been handed down by our forefathers,

Should this document be brought to Síac, Níla láwan or Patápaán, to Campar kíri or Campar kánan, molest not the bearer by sea or by land. These injunctions extend to Palémbang, Indraghiri, to Rogum, to the villages and forests of Tambusai, to Battu Bara, to Pulo Penang, to Malacca, Qèdah, Java, Batavia, Susu, Telabúah, Guttar, and Bencoolen, which is subject to the Company, together with other places on the west coast of *Pulo Andalús*.

Let us all, therefore, to the utmost of our power, place firm confidence in the great and glorious God, according to our solemn oaths, and the oath "*Bisa Gawye*" of our ancestors.

Should any person therefore molest the bearer of these, he shall draw down on himself the ban of the *Eang depertúan* of Paggarúyong; his crops shall fail, and his subjects shall not thrive; but on the other

* The Sambaráni سمبراني is a fabulous horse, celebrated in Malay romance, generally said to be winged.

hand, whoever receives the bearer with kindness, shall be rewarded with abundant harvests, and increase of subjects, and whithersoever he may go and settle, prosperity shall attend him, whether on the coast of the Island of *Púlo Pércha* or any other place by sea or by land.

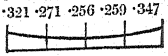
Oh Lord of lords and Helper of helpers, the most wise God."

II.—*Comparison of the Heights of the Barometer, with the Distance of the Moon from the Celestial Equator. By the Rev.* R. EVEREST.

[See Proceedings of the Asiatic Society, 6th May, 1835.]

In my last paper, I shewed, that on an average of ten rainy seasons, the daily amount of Rain-fall diminished, as the declination of the moon increased, until it reached between 10° and 15°; but that after that distance, the reverse took place, and the amount of Rain-fall increased as the declination increased. The general average of the 10 years for every 5° distance from the Equator gave the following results:

Declination	0°	5°	10°	15°	20°	25°	from the Equator.
Inches of Rain	·321	·271	·256	·259	·347		



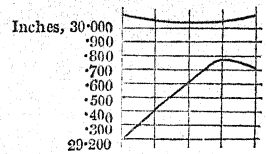
It was but natural to suppose, that the height of the Barometer would vary in a similar manner, or rather the reverse, i. e. as the one increased, the other would diminish, and vice versâ—with this expectation, I made a Table of the heights of the Barometer, as I had before done of the Rain-fall. The 4 P. M. observations were selected from the Registers, as being nearest the time of noon at Greenwich, when the declination of the moon was taken; but I did not at first obtain results so satisfactory as I had expected. On taking the general average of the 10 years, a considerable depression (as much as ·040 in.) appeared, when the declination was greater than 20°; but from that to the equator, the heights were irregular, and nearly on a level. But in examining the Registers, for the purpose of making out the tables, I could not help observing, that though all the greatest depressions coincided (or nearly so) with the times of the moon's maximum declination, yet that many of the greatest elevations held a similar situation. The inference of course was, that a principle of compensation was somehow or other at work. I now became acquainted with the opinion of an eminent philosopher, that any elevation of the barometer in southern latitudes must have the effect of producing an equal depression in a corresponding northern latitude. If we only generalize this assertion a little, and say, "that any de-

pression in any particular spot must have the effect of producing an elevation somewhere else," then, we may see why in any one place (taking the year throughout) the maximum elevations and minimum depressions on the same days of the moon's courses coincide, &c. But it is straying from the subject, to attempt to reason upon phenomena, while we are as yet only in the threshold of our inquiry.

In pursuance of the idea I have above mentioned, I next took the maximum elevation that occurred in each successive division of 5° of the moon's distance from the equator in each year, and then took the general average of the whole 10 years. I did the same with the minima, and obtained the following General Average.

Declination	20°	15°	10°	5°	0° Equator.
Bar. max. inches 30·032	·033	·026	·026	·022	
Do. minima, .. 29·236	·313	·355	·379	·375	

These two series of numbers would very nearly form two curves, with their convex surfaces to each other, thus:



[We are sorry to perceive that the diagram which was copied from the rough sketch in the MS. without advertence to the text, does not faithfully represent the figured statement; but the author's intention will be easily understood.—Ed.]

I will now leave this part of my subject, as I shortly expect some further Registers and Nautical Almanacks for comparison, and I will hereafter revert to it more in detail, and make out a Table more at length, shewing the results of each year. I have brought it forward now somewhat prematurely, because from sickness and consequent removal from home, my labours must be suspended for some months, and I am desirous before that happens, to bring forward the following note, which I humbly hope may not be without its use to a large and important class of the community. This was the end which I proposed to myself in commencing a long and laborious investigation, and, if I attain it, in any degree, my purpose will have been more or less answered.

Note.

Shewing, that the greatest depressions of the Barometer do not, (as some have conjectured,) coincide with the days of conjunction and opposition of the moon, neither with the days of her perigee, but that they coincide, or nearly so, with the days of her maximum monthly declination.

For Example.

In the ten* years of which the barometrical daily changes have been re-

* The ten years alluded to are: 1823, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834.

gistered at Calcutta, there are (6) *six* instances in which the barometer has fallen below the height of 29·200 inches.—I here add the dates of each instance, with the heights of barometer and declination of moon three days before, and three days after; also the day of nearest new or full moon. The hour of 4 P. M. has been chosen, as corresponding better than any other to the hour of noon at Greenwich, at which time the declination of the moon was taken.

1823.	Bar. 4 P. M.	Inches. Rain.	Moon's Dec.
August.			
5th, noon, Perigee.			
6th, nearest.			° ′
12th,	29·321	..	18 29 S.
13th,	·313	..	22 8
14th,	·276	..	24 41
15th,	·180	0·52	26 3
16th,	·388	3·32	26 12
17th,	..	2·56	25 9
18th,	·526	3·00	22 59

Note.—The real max. on 15th, at midnight, 26° 16′.

1829. June, 21st, noon, Perigee. 30 days, 16 hours, new moon.			° ′
27th,	29·185	6·20	14 13 N.
28th,	·407	..	16 34
29th,	·491	..	18 0
30th,	·474	..	18 27
July.			
1st,	·454	0·16	17 55
18th, midnight, Perigee.			
30 days, 5 hours, new moon.			
26th,	29·421	..	17 36 N.
27th,	·382	..	18 20
28th,	·298	0·72	18 6
29th,	·159	0·28	17 0
30th,	·301	0·58	15 6
31st,	·445	0·15	12 33

The declination at noon, 27th, is, 18° 20′ 5″, and the declination, 27th, at midnight, is, 18° 20′ 22″, so that the real maximum is within 1 day, 12 hours of the depression of Barometer.

1833. May, 24th, noon, Perigee. 19 days, 1 hour, new moon.

	Barometer.	Rain.	Moon's Dec.
19th,	29·500	..	15 49 N.
20th,	·376	0·98	19 11
21st,	28·868	2·90	21 30
22nd,	29·300	5·34	22 32
23rd,	·425	..	22 7
24th,	·340	..	20 7

The real maximum declination is 22 days, 6 hours, Greenwich time.

1830. May, 20th, midnight, Perigee. 21 days, 19 hours, new moon.

	Barometer. 4 P. M.	Rain. Inches.	Moon's Declination.
21st,	29·452	..	13° 5′ N.
22nd,	·514	..	16 4
23rd,	·487	..	17 56
24th,	·427	0·10	18 36*
25th,	·306	3·00	18 7
26th,	·107	4·22	16 36
27th,	·434	..	14 15
28th,	·444	..	11 18
29th,	·521	..	7 55

Note.—The greatest depression of barometer occurred at noon on the 26th,

when it stood at 29·008, and reducing this to the level of 4 P. M., by subtracting (·087), the average monthly difference between noon and 4 P. M., there is left 28·921 inches for the theoretical height of Barometer at that time. Noon 26th is, of course, by Greenwich time, 25 days, 18 hours, nearly.

1834. August 7th, midnight, Perigee. 4 days, 18 hours, new moon.

	Barometer.	Rain.	Moon's Dec.
1st,	29·178	..	22° 40′ N.
2nd,	·110	2·20	24 6
3rd,	28·820	4·10	24 11
4th,	29·344	0·70	22 47
5th,	·368	..	19 55

The real maximum is on the 2nd, nearly at midnight, or 2 days, 13 hours, Greenwich time.

The Perigee is evidently out of the question. The comparison between the time of conjunction, and that of moon's maximum declination, with the barometric minimum, may be more clearly stated in a table, shewing the distance of each of the former in days and quarters of days from the latter, thus:

	Distance of Time of moon's maximum declination.		Time of new moon.		
	Days.	Qrs.	Days.	Qrs.	
1823, Aug. 15th,	0	2	7	0	From the nearest barometric minimum.
1829, June 27th,	3	0	3	3	
1829, July 29th,	1	2	1	1	
1830, May 26th,	1	3	4	0	
1833, May 21st,	1	1	2	0	
1834, Aug. 3rd,	0	2	1	3	

Making the same allowance as is done in the case of the tides, viz. three days before, or three days after the event, for a coincidence; all these instances of moon's maximum declination may be considered as coincidences with their respective barometric depressions: it is evident, that the times of conjunction cannot be so considered. We must observe that the only instance of great separation between the time of moon's maximum declination and the barometric depression, was in 1829, when the maximum declination of moon was at its least (not above 18° 20′), and consequently only faintly felt.

It now only remains for us to notice the minor barometric depressions, which have occurred during the same period, and we will first take the minima of the years which were above 29·200 inches. From the increase of rain, which occurs when the moon gets within 10° degrees of the equator, we might have supposed that the next lowest depressions would probably be found there—and this turns out to be the case. I here subjoin the details.

1827.	Barometer.	Rain.	Moon's
June.	4 P. M.	Inches.	Declination.
28th,	29·314	..	9 40 N.
29th,	·222	4·40	5 45
30th,	·207	3·72	1 31 N.
July.			
1st,	·390	0·38	2 51 S.

Nearest new moon, June, 23 days, 22 hours; say 24 days, or 7 days' distance from the depression.

1832.	Barometer.	Rain.	Moon's
October.	4 P. M.	Inches.	Declination.
5th,	29·763	..	15 51 S.
6th,	·688	1·71	12 31
7th,	·201	3·54	8 34
8th,	·696	1·65	4 11 S.
9th,	·697	..	0 28 N.

Nearest full moon, 9 days, 7 hours; or 2 days, 7 hours' distance from the depression.

The minimum depressions of the remaining years are still higher, and irregularly placed with regard to the moon's declination, as follows:

1826. July.	Barometer. 4 P. M.	Rain.	Moon's Declination.
27th,	29·317	..	16 40 N.
28th,	·290	..	19 5
29th,	·313	0·06	20 41
30th,	·361	1·08	21 22
31st,	·487	..	21 3

Nearest new moon, August, 3 days, 7 hours; or 6 days, 7 hours' distance from the depression.

1828. July.	Barometer. 4 P. M.	Rain.	Moon's Declination.
21st,	29·373	1·07	14 17 S.
22nd,	·352	0·12	16 47
23rd,	·352	0·08	18 22
24th,	·394	0·84	18 48
25th,	·451	0·78	17 58

Nearest full moon, 26 days, 10 hours; or 3 days, 10 hours' distance from the depression.

1831. July.	Barometer.	Rain.	Moon's Declination.
22nd,	29·496	0·12	19 26 S.
23rd,	·492	..	19 31
24th,	·546	1·35	18 40
25th,	·451	..	16 55
26th,	·379	0·38	14 19
27th,	·291	..	11 0
28th,	·302	0·25	7 6

Maximum declination, 4 days' distance from depression.

Nearest full moon, 24° 9′, or nearly 2½ days, distance from depression.

There are yet some further minor depressions, which we must not omit, as though they are not the minima of any particular years, they are much lower than some of those we have been considering. I subjoin the details of all under 29·300 inches.

1823. June.	Bar.	Rain.	Moon's Decl. ° ′
8th, ..	29·403	Unknown,	25 47 S.
9th, ..	·430	..	26 12
10th, ..	·359	..	24 41
11th, ..	·267	..	21 25
12th, ..	·274	..	16 48

Nearest new moon, 8th.

1823. July.	Bar.	Rain.	Moon's Decl. ° ′
16th, ..	29·282	Unknown.	19 43 S.
17th, ..	·255	..	23 0
18th, ..	·311	..	25 13
19th, ..	·353	..	26 15
20th, ..	·355	..	26 4

Full moon, 22nd.

1827. June.	Bar.	Moon's Decl. ° ′
17th,	29·391	6 18 N.
18th,	·245	10 12
19th,	·252	13 36
20th,	·404	16 22
21st.	·459	18 25
22nd,	·509	19 39
23rd,	·473	20 2
24th,	·486	19 31

Declination at time of depression, 10° 12′. Rain, 1·90.

1827. July.	Bar.	Moon's Decl. ° ′
16th,	29·271	12 33
17th,	·259	15 33
18th,	·313	17 49
19th,	·312	19 18
20th,	·331	19 55
21st,	·396	19 41

Rain 1·66.

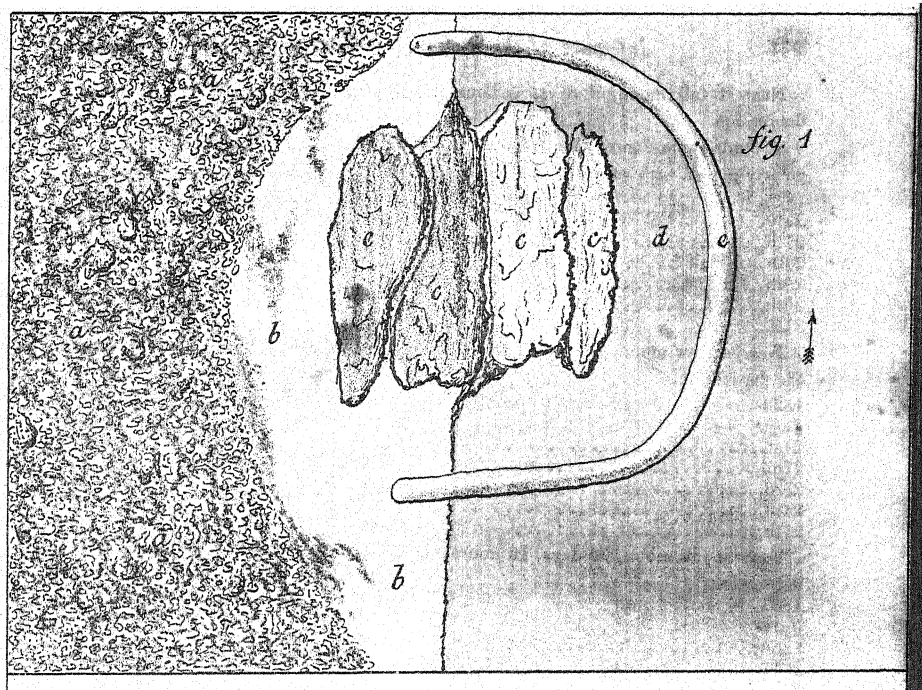


fig. 1

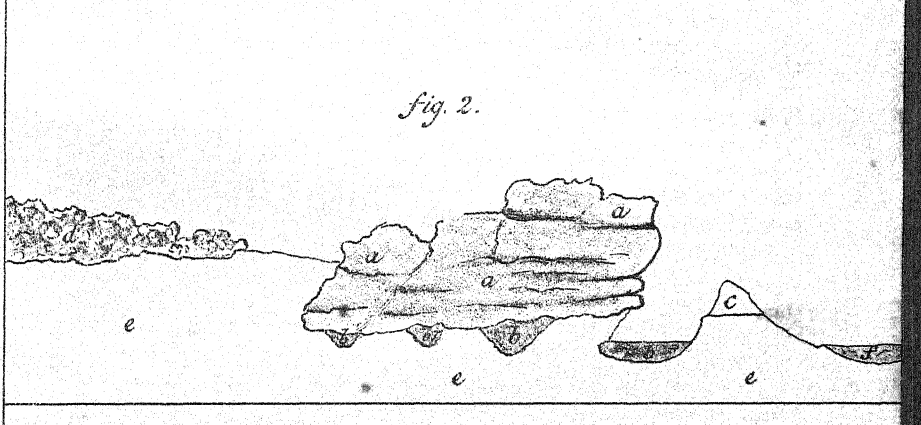


fig. 2.

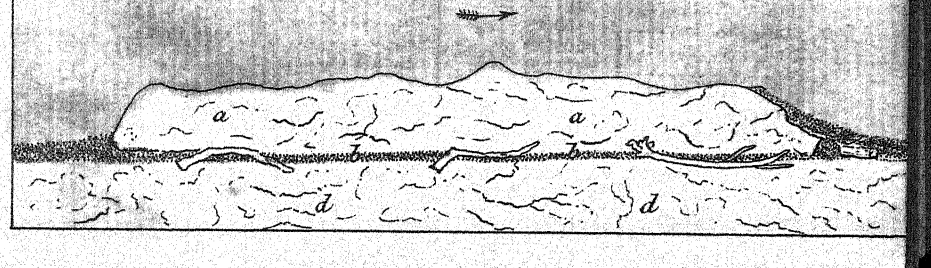
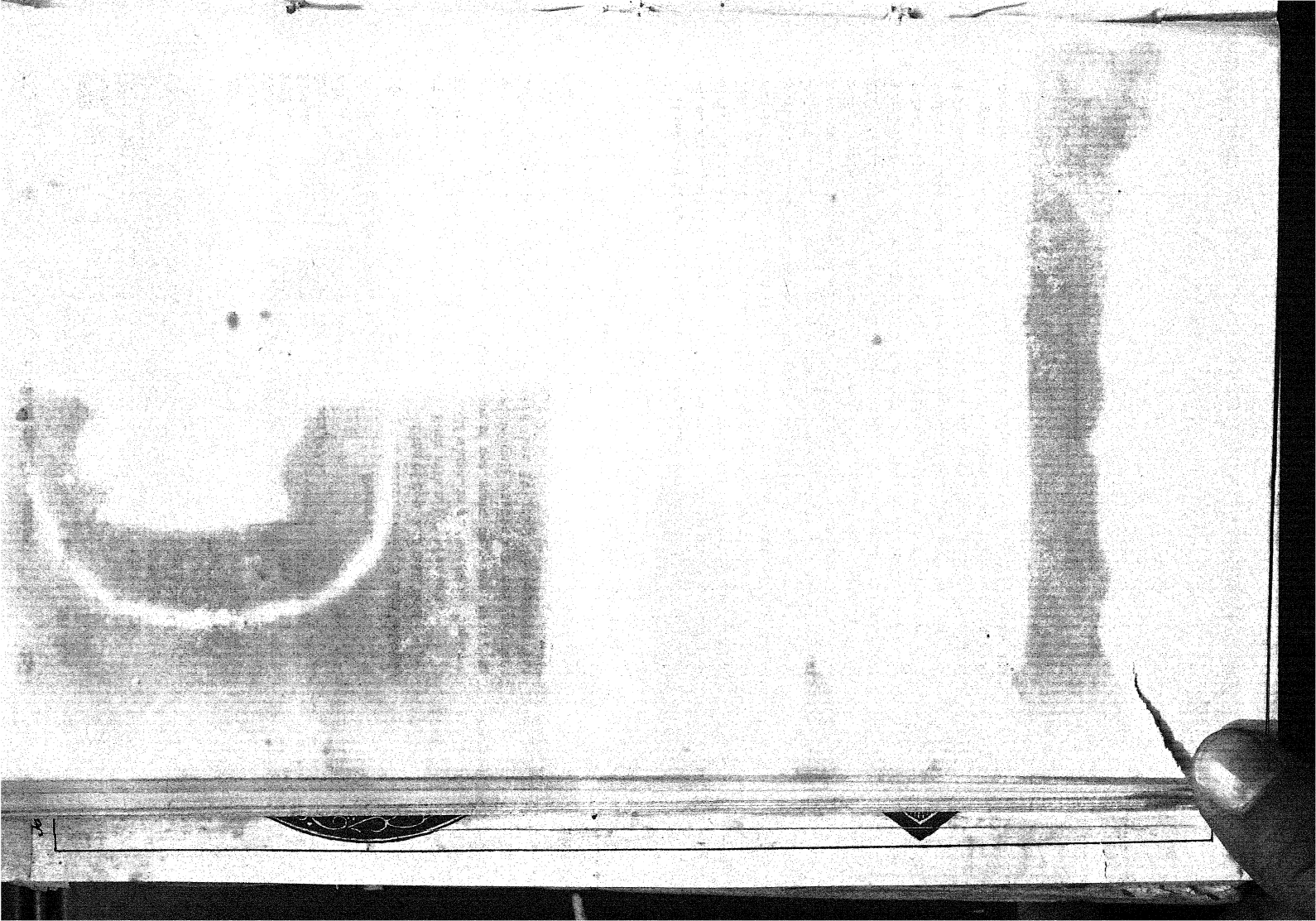


fig. 3.



1829. June.	Bar.	Moon's Decl. ° ′
3rd, ...	·314	18 20
4th, ...	29·292	17 28
5th, ...	·253	15 45
6th, ...	·494	13 21
Rain, 2·18.		

1832. July.	Bar.	Moon's Decl. ° ′
26th, ...	29·360	20 50
27th, ...	·302	19 26
28th, ...	·296	16 39
29th, ...	·371	12 48
Rain, 0·87.		

1834. June.	Bar.	Moon's Decl. ° ′
19th, ...	29·287	18 53 S.
20th, ...	·230	22 4
21st, ...	·342	23 53
22nd, ...	·418	24 16
23rd, ...	·472	23 15

1834. July.	Bar.	Moon's Decl. ° ′
24th, ...	29·398	11 1 S.
25th, ...	·298	6 22
26th, ...	·370	1 32
Rain 0·75.		

Summary of Depressions. *Remarks.*

6, greatest, ... (all below 29·200.) In one instance only, 3 days between time of dep. and max. decl.

2, lesser,.. (between 29·200 and 29·220.) Both within 10° of equator.

10, least, .. (between 29·220 and 29·300.) Of which, in six instances, the time between maximum declination and depression is not more than two days; in one instance, three days; in one instance, moon's declination was less than 10°; two instances, irregular; one, 12′ more than 10° from the equator; one (·291), of four days' distance between time of depression and maximum declination. I must now end this paper, begging permission to resume the subject, as I may find opportunity to do so.

ROBERT EVEREST.

It may not be deemed out of place to notice here the amount of wind and rain, which accompanied each depression. In five cases out of the six, a depth of rain of from 6½ to 9 inches was deposited within three days of the depression. In 1823, no notice is taken of the wind in the Register, but the Kedgeree report states, "light airs" on August 15th, (the day of the depression,) and "hard gales from southward and eastward" on the (16th), the day after. The Gazette laments inundations in the upper parts of Bengal, loss of life, villages swept away, and devastation of the crops. In June, 1829, the Register notes on the day of depression "violent wind all night, with thunder and lightning." In May, 1830, and May, 1833, were violent storms or hurricanes, the effects of which must be yet remembered by most of us. In August, 1834, was a heavy gale of wind. In July, 1829, alone, neither the quantity of wind nor of rain appears to have been great. The former is not noticed, the latter was less than 1·75 inches. We may remark too, that in the first instance alone, viz. that of August 15th, 1823, was the declination of the moon south. The rest have all occurred between the 20th May and 4th August, or from 31 days before the summer solstice, to 44 days after it.

III.—*Collimation Error of Astronomical Instruments. By* J. G. TAYLOR, *Esq. H. C. Astronomer, Madras.*

Ten years have now elapsed since Captain KATER's plan for determining the position of the line of collimation by means of a floating collimator was brought before the public, and his ingenuity rewarded by the gold medal of the Royal Astronomical Society. It has happened, however, with this, as with many other great and good inventions, which are true in theory, that the application to practice is attended with so much uncertainty, as almost completely to render the plan unavailable; hence it is, that the results of observations made with the assistance of the floating collimator (if any there be) have never yet been made public. I offer these remarks with a view of saving the amateur astronomer from the vexatious disappointments which he may expect to meet with in the employment of the floating collimator; and, at the same time, of offering a plan to supersede its use, which is totally free from any sort of uncertainty: and can, moreover, be applied with much greater facility than the floating collimator; the plan in question consists of *making the telescope a collimator to itself*, by viewing the *image* of the wires reflected from a basin of quicksilver, at the *same time* that the direct image is viewed in the ordinary way through the eye-piece; to accomplish this, it is only necessary to exhibit a bright light behind the wires, so as not to interfere with the eye of the observer when applied to the eye-piece—in the case of the Madras Mural Circle, to which this principle was lately applied, I introduced a plain silver speculum into the eye-piece of the telescope between the eye-glass and the wires, having its polished surface directed towards the wires; the speculum was suspended in the cell of the eye-piece by two screws, allowing it to revolve on them as an exis, and was furnished with a small hole in the centre, through which the wires in the telescope could be seen; the telescope being now directed to the nadir to a basin of quicksilver, the speculum was turned on its axis until a ray of light (admitted through a hole about $\frac{1}{10}$ of an inch diameter, drilled in the side of the telescope), was reflected from it, and made to fall perpendicularly upon the wires (an operation occupying about five minutes to adjust, and not afterwards requiring alteration), by this means, in addition to the ordinary direct image of the horizontal wire, a reflected image was obtained, situated as much to the north of the nadir as the other was to the south, and vice versâ; nothing more was necessary now than to clamp the circle and bring the wire to cover its reflected image by the tangent screw, when the reading gave (the circle being adapted to measure north polar distance) 180° + colat. + E; subtracting the two former or 256° 55′ 50″ E., the error of collimation, became known. Since establishing the above mode of observation, which I

propose to call the *reflecting collimator*, the error of collimation (or index error as it is generally called) has been read off five times every day, viz. at 6 A. M., at noon, at 6 P. M., at 8 P. M., and at midnight; taking the mean of these, the error of observation is necessarily very small, and the effect of any accidental difference of temperature in the room, which might alter the figure of the circle at any one time of the day, is at the same time greatly diminished.

To shew to what extent this mechanical measure, as it may be termed, can be depended upon, I here subjoin the result of the last ten days' observation compared with the index error determined by astronomical means, thus:

INDEX ERROR OF THE MADRAS MURAL CIRCLE.

		By the Reflecting Collimator.		*By Astronomical Observation.*		
1835		No. of Obs.	Index Error.	No of Obs.	Index Error.	Difference.
			′ ″		′ ″	
Feb.	21	5	—2·27·36	6	—2·27·39	0·03
	22	5	27·92	8	27·73	0·19
	23	5	27·64	9	27·45	0·19
	24	5	26·46	7	26·74	0·28
	25	5	27·50	7	26·50	1·00
	26	5	27·22	6	27·34	0·12
	27	5	27·28	9	27·10	0·18
	28	5	26·80	8	27·54	0·74
March,	1	5	26·91	9	27·31	0·40
	2	5	26·83	9	27·54	0·71

As a further proof of the efficiency of the reflecting collimator, I may adduce the result of observations made at this observatory with the transit instrument. Here we read off twice the sum of the errors of level and collimation, either of which being known leaves us acquainted with the other. In the case of the Madras transit instrument, which is furnished with a micrometer, giving motion to a wire parallel to the vertical wires, I have always preferred measuring the error of collimation, and computing the corrections rather than attempting by mechanical adjustment to get rid of it, as is usual with small instruments; and, on the same principle have always allowed the axis to take up its own position with regard to level; hence we have only to apply to half the micrometer-reading of the reflecting collimator, the error of level with the proper sign, and the sum or difference, as the case may be, gives the error of collimation, thus:

1835.		*Reflecting Collimation,* or L+C	*Spirit Level,* or L	*Error of Collimation* by Refn. Coll.	*Ditto* by Inversion.	Difference.
		″	″	″	″	″
Feb.	7	4·34	2·60	1·74	1·55	0·19
	9	4·22	2·97	1·25	1·20	0·05
	11	2·92	2·74	0·18	1·00	1·18
	11	9·80	2·74	*7·06	5·58	1·48
	12	9·28	2·41	6·87	6·73	0·14
	13	9·18	2·61	6·58	6·62	0·04
	16	9·83	2·42	7·41	6·29	1·12
	17	9·97	1·63	7·34	7·17	0·17
	18	9·89	2·04	7·85	7·20	0·65
	20	9·37	2·70	6·67	7·19	0·52

* I increased the collimation error.

The above readings of the reflecting collimator are the result of three measures occupying at most about as many minutes to make; and the collimation error by inversion is from one inversion only. As regards the wants of the amateur astronomer in India, the reflecting collimator will I apprehend be eminently serviceable, if (as is very often the case) the level attached for levelling the axis is dull in its movements, or should it unfortunately be broken; and should moreover the observer's situation preclude the erection of a mark to examine the collimation error—nothing more is necessary than a basin of quicksilver and an eye-piece fitted up as above.

We will suppose that on looking into the eye-piece the centre wire and its image are *both seen*, and that the reflected image appears 10 diameters of the wire by estimation to the *east* of the direct image; this may arise from error of level or error of collimation, or from both; to decide this question, we must invert the axis and again estimate the distance between the direct and reflected images of the centre wire—suppose the reflected image to be now situated 6 diameters of the wire to the *west* of the direct image: we have,

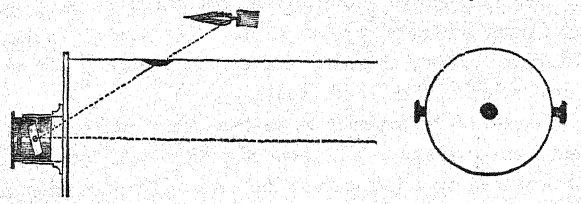
$$\begin{matrix} 2\ (L+C) = +\ 10 \\ 2\ (L-C) = -\ \ 6 \end{matrix}$$ reckoning + for eastern and — for western deviation: from the sum we find $L = +\ 1$.

———difference,..... $C = +\ 4$.

Shewing that the east end of the axis is too high by a space corresponding to the thickness of the wire, and that the centre wire must be moved towards the east four times its thickness. Other instances might be adduced of the efficiency of the reflecting collimator, but the above will I apprehend be considered sufficient.

A mere glance at the accompanying figure will explain all that is necessary to the construction, which I need hardly remark can be performed by any common workman.

Reflector, full size.



Madras Observatory,
5th April, 1835.

[The elegance, the simplicity, and the great practical accuracy of the method described above by the Madras astronomer, will we have no doubt recommend it to very general adoption.—ED.]

IV.—*On the Strata of the Jumna Alluvium, as exemplified in the Rocks and Shoals lately removed from the bed of the river; and of the sites of the Fossil Bones discovered therein. By Serjeant* Edmund Dean.

[The Specimens alluded to are deposited in the Society's museum.]

It has always been a matter of speculation with me, since my first acquaintance with the Jumna, that presenting the obstacles to navigation, which it, undoubtedly, does at the present day, after seven years' application of great talent, and a very considerable expenditure, what a gigantic work it must have appeared at its commencement. Experience, however, and a careful research have confirmed me in the opinion, that many of these impediments in one shape or another, were then, and are now, not only such as, their existence once known, could easily be removed, but there is every probability of some of the most dangerous of them being at this instant in a state of active formation and increase.

Taking a general view of the whole, as they occur between Agra and Allahabad, I have found it convenient to class the obstacles most to be dreaded by navigators, as follows:

1st, Clay-banks or shoals; 2nd, Rocks; 3rd, Kankar shoals, and 4th, Sunken trees. This classification is adopted with reference to the supposed degree of danger to the navigation that may be attached to each, a detailed description of which I have endeavoured to arrange in this order.

The grand and perfect section of *the Delta of the Jumna and Ganges*, (or I should rather say, from experience lately gained to the westward, of the immense general alluvium of Hindustan, opened by the channel of the former,) presents a regular alternating stratification of the different modifications of which the general Dúab alluvium is formed; which consists (as far as the section has allowed me to examine), of five distinct strata, interspersed with imbedded substances which from their irregular growth, positions, and occurrence, cannot be classed among the more regular strata. The regular strata occur as follows, namely, 1st, Superior sandstone; 2nd, Shale, and 3rd, 4th, and 5th, Alluvial, (fig. 1. Pl. XIII.)

Only two strata of the superior sandstone occur within the above bounds that I am aware of. The elevated positions of both decidedly have been produced by volcanic irruption, and will be described under the head of rocks.

The Shale which approaches nearest to *d*, var. of A. in the first division of McCulloch's synopsis, described as passing into clay, appears very seldom. *Note.* The specimens marked "*y*, 1, 2, and 3," all stand the

test of adhering on being applied to the tongue or lips. (Specs. *y.*

1*st. Alluvial Clay*, corresponding with *a*, var. of C., first division; is much intersected with seams of kankar $\frac{3}{8}$ of an inch in average diameter, colour dull yellow, grey, and dirty white, and is interstratified with beds of nodule kankar varying between 20 yards, and half a mile in length (as exposed by the river), and from one foot to 15 in thickness.

2*nd. Alluvial Compact Sand* would form a var. *e*, of C., first division; does not agree with *c*, of the same division, as there is no portion of clay, and it is only partially consolidated by the pressure of superincumbent strata. It occurs both above and below the 1st alluvial stratum from 3 to 18 inches thick, and of indefinite length and breadth; in some places a few yards, in others several miles.

3*rd. Alluvial Clay*, with a large proportion of sand *b*, var. of C., first division of Mr. McCULLOCH's synopsis. This stratum is frequently varied in colour, giving it an appearance of divisibility; but on examination, this difference will be found to extend to colour only, which varies in many places between dull yellow and grey.

1*st. Of Clay Banks or Shoals.*

These banks (fig. 2. Pl. XIII.) so justly dreaded by navigators of the Jumna, are quite as unwelcome to those engaged on the Jumna works, as their removal is both troublesome and expensive. They are formed of isolated and detached portions of the 1st alluvial stratum, by an accumulation of sand forcing the stream into a new channel, formed by the whole of the 2nd and 3rd alluvials, and least tenacious parts of the 1st alluvium, having been swept away at high levels, leaving such portions of the last as were sufficiently compact to withstand the force of the stream, which are generally those where the natural toughness of the clay is increased by the seam kankar before mentioned, (spec. *x*,) which runs in every direction through it, literally lacing it together, and giving the clay a durability which the action of the strongest current has, perhaps, less effect upon, than it would have on a similar mass of stone of average texture.

The stream, which is generally confined in its course by these obstacles, rushes past them with violence, polishing (as much as clay is capable of such an operation) all those parts exposed to its action.

It was in the crevices formed by the washing away of the softer parts of a bank of this description, (figs. 1 & 2, Pl. XIV.) that the specimen of fossil bones, which were, I believe, presented by Capt. SMITH, and the tulwar, by Lieut. BURT, were found, whilst the clay bank was being removed, the whole upper surface of which was covered with from two to four feet of kankar, of the conglomerate formation. I should wish this to be remembered, as I consider finding the latter in such a

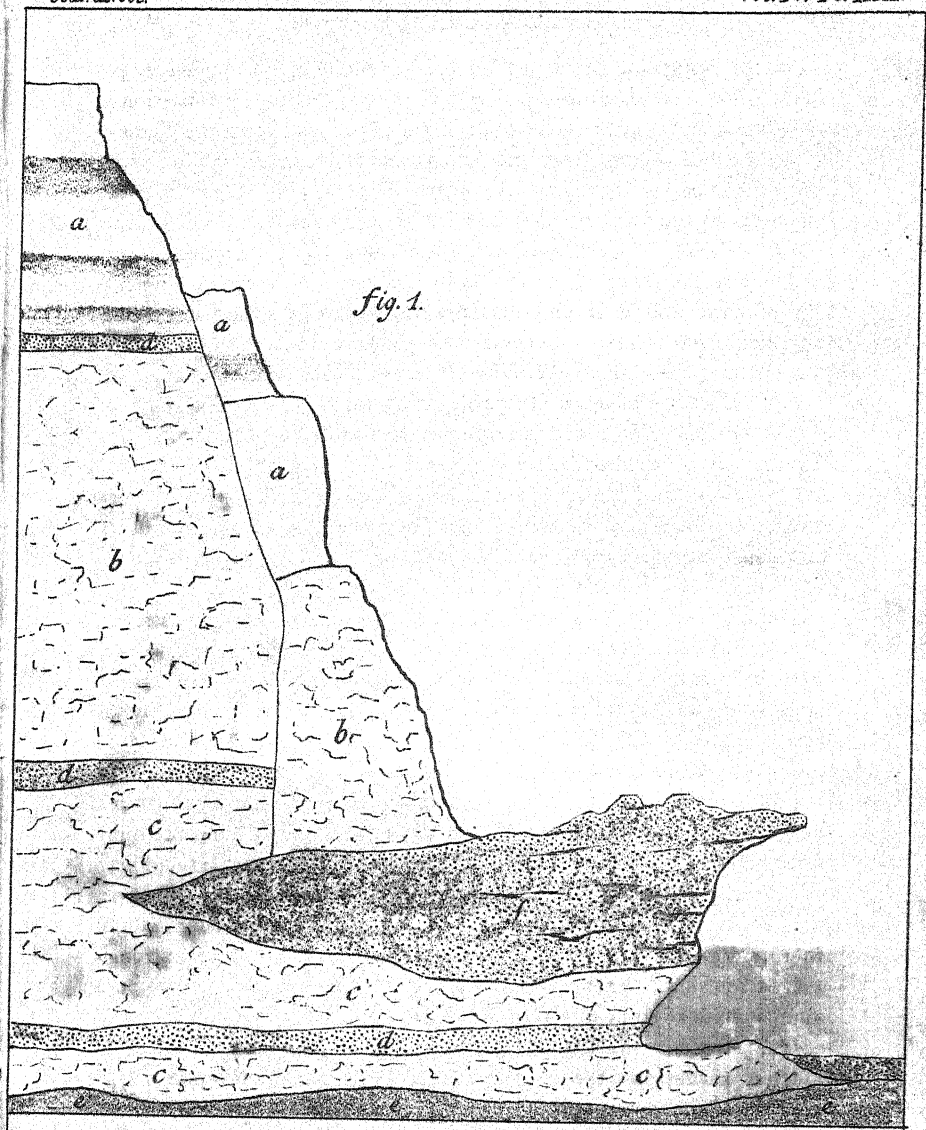


fig. 1.

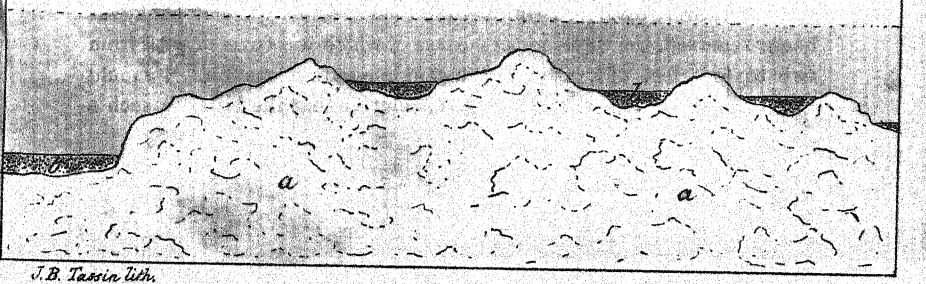


fig. 2.

J.B. Tassin lith.

situation as peculiarly corroborative of my remarks relating both to these banks and to the kankar formation. No instance, however, has ever been known of petrified or fossil animal, or vegetable remains, having been found fairly imbedded in or under this stratum.

Another formation of these banks is occasioned by the current sapping the high and abrupt banks of the river, by washing out the strata of compact sand, when such large masses of stiff clay are detached and thrown into the channel, as to defy the efforts of the stream to dislodge them, which if not speedily effected, a sufficient time has only to elapse to clear the outer parts of the earthy matter which may have fallen with them, which together with sand immediately deposits itself in rear, when every hour secures and strengthens them in their position against the stream, (fig. 3. Pl. XIV.) The interstices (should there be any) are soon filled up with any extraneous substances that may be lodged by the current. Those organic remains which may happen to be imbedded, or rather buried under this sudden deposit, if petrified in that situation, may be easily distinguished, as they invariably adopt in the process of petrifaction, the hue of the mass with which they are in contact, and which, when the process is complete, nothing will remove, and the porous parts of the bones either remain empty, or are filled with carbonate of lime, infiltrated, whilst in solution. The same remark applies to wood or any other substance. In every other situation the interstices of the fossil to which the water has unrestrained access, is filled with either silicious or argillaceous matter, and frequently with a composition formed of both. For the proper consolidation of either of which, however, the presence of the carbonate of lime is necessary.

Both these formations may be, and frequently are, instanced in one specimen, where from fracture or decomposition, sand or clay may be admitted to one part, when the composition is formed, whilst it is excluded from those more perfect, the pores of which will be either filled with crystallized carbonate, or remain empty as above stated.

By the continual cutting away, and falling in of the banks of the river, the accumulation of alluvial matter in some places is necessarily very extensive. The strength of the current preventing its deposit in the channel, it is carried down to the bend of the river, next below whence it has been dislodged, in the shape of thick sediment, and deposited there; the sand which accompanied its removal is from its greater specific gravity deposited in the bed of the channel. This alluvium forms in banks from 6 to 14 feet thick, and composes, on a rough calculation, not less than 80 or 100,000 acres of arable land, of the first quality, between Agra and Allahabad; producing by

far the best crops of any land in the neighbourhood of the Jumna. Many of these deposits (which occur at every turn of the river) are several feet above its present highest levels; these, however, the river by having deepened in its course since their formation, rather diminishes than increases by washing out those veins of sand, (parallels to the 2nd regular alluvial stratum of the Dúáb general alluvium,) from one to six inches thick, which are invariably interstratified with this deposit: the more compact alluvial stratum above these veins being deprived of their support, separate and fall into the water in flakes, when, if the current is not too violent, the base of another deposit is formed, corresponding to the levels attainable by the river in its present bed, causing the upper surface of the united deposits, either to slope gradually towards the deep part of the channel, or the junction to be marked by a step or steep slope. All those, however, which are covered with only a few inches of water at the highest levels receive an additional deposit of sediment, which, however trifling, answers the purposes of the best manure.

2nd. Of the Rocks.

This term (as understood on the Jumna) is applied to four distinct formations, namely—1st, superior sandstone; 2nd, volcanic; 3rd, isolated masses, the remains of beds of nodule kankar, and 4th, conglomerate rocks, composed of kankar and extraneous substances.

1st. *Of the superior Sandstone.* The only strata of this formation occur at intervals between the neighbourhoods of Bárriari and Dhowrie, two villages on the right bank of the river, and near Mhow, a village in the Bundelkhand.

Near Barriári a great deal of good stone for building purposes, and of any dimensions, is quarried, (fig. 1. Pl. 3. spec. 1.) and sent to Allahabad. Very good stones are also procured from many parts of the bank near the above places, by removing two or three feet of loose earth or clay. It is fine grained, and very similar in colour and quality, to that procured from the neighbourhood of Bhurtpore. In fact I believe them to be portions of the same stratum, but am not sufficiently acquainted with the geological features of Bundelkhand (the intervening tract) to make the assertion.

A portion of this stratum, thrown together in large masses by volcanic irruption, forms the curious little rocky island on which a Shiwala is so picturesquely perched in the centre of the river opposite the village of Dhowrie, about two days' journey from Allahabad.

The other stratum occurs at Mhow only, and extends more than one-third cross the river, and is so friable and coarse as to be totally unfit for any useful purpose. Occupying its present situation, it

has caused infinite trouble, not only by the interruption a body of any sort must be to the navigation in such a place, but by the irregularities of its surface (forming the bed of the river), acting as receptacles for the moving kankar and other extraneous substances passing over it, in which have formed irregular masses of conglomerate rock occupying two-thirds of the whole width of the river. These, perhaps, at the time of their formation did not stand more than a few inches above the bed of the river, (the upper surface of the sandstone rock,) but the river deepening its bed in the course of ages has gradually worn away the sandstone, leaving the masses of conglomerate (on which it can make no impression), in the awkward and dangerous positions which they now occupy, with deep water all round them; and although some of the most dangerous have been removed, the passage down with a side wind is often impracticable to the clumsy boats used on the Jumna. It has this advantage over Karim Khán, (the worst pass in the river,) that the stream is not near so rapid.

Those portions of this stratum which lie near the edge are exposed to the effects of the stream in a minor degree, and stand from one to five feet above the lowest levels, presenting peaks and heads of masses at irregular intervals over a space of about 500 by 200 yards. The exteriors of these are of a dirty green colour, which penetrates about one-eighth of an inch, and is, I imagine, caused by the action of the atmosphere. Under this coating, the natural colour of the stone appears, varying between every tinge of yellow and red, and pure white, which would indicate the presence of some portion of iron; but one sight of the accompanying specimens will convince you, Sir, that but for the presence of some consolidating medium, the sand of itself would never resist the action of any stream. This consolidation occurs in the shape of numerous veins, from one-fourth to two inches in thickness, and from three inches to many feet in width, passing through it in every direction, and rendering it quite impervious to the stream with which it has to contend; and from the feeble attempts of which it is in fact defended by some masses of volcanic origin, which are described below. These veins (spec. 2) are either the deposit of some ferruginous spring, which has had a passage over the stratum, and on which the sand has from time to time accumulated, or is a lignitious lava; they occur in every position, horizontal, vertical, and at every possible angle with each of these: their outer edges are black, and bear a very high polish, produced by the action of the water. The fracture presents an appearance which would justify the conjecture of this substance having passed into the present position in a state of fusion, as it encloses a substance within itself, having a vitrified appearance.

The total absence too of iron within the bounds I am endeavouring to treat of, in any of the alluvial formations, and the intimate connexion existing between the sandstone, and substances of undoubted volcanic origin, strongly incline me to the opinion, that the heat necessary for the production of the latter, might have split the former, and that the interstices thus produced, have filled with the lava, (the present veins,) in a state of fusion. Another circumstance, confirmatory of this, is the fact of the sandstone being in a state of transition with the vitrified substances; but owing to the brittleness of the intermediate substance, (spec. *d.*) it was with the greatest difficulty I could procure the accompanying specimens.

Of the Volcanic Rocks.

These occur in two separate situations, namely, at Murka and Mhow. You will perceive, Sir, that the specimens from the former place, agree with Nos. 4, from the latter, although the shortest distance between these places cannot be less than 20 miles, perhaps more.

The mass at Murka, consisting of rough spheroidal blocks, varying from one by two, to three by five feet, lies on the right bank of the river; their peculiar shape, appearance, and position, leads me to imagine, that they have been ejected in a partially vitrified state, and lodging in the water, the outer and angular parts have become slacked, and have been swept away by the stream, leaving these blocks, which, under these circumstances, are exactly similar to the core of badly burnt lime; in no other way can I account for their peculiar formation, which had it been produced by rolling, the same cause would have scattered them widely, but this has not been the case, as they lie in a clearly defined mass, (fig. 2. Pl. XV.) and in this instance, have no other connexion with any other stratum than being superincumbent.

They correspond exactly with Nos. 4, from Mhow, both in the degree of vitrification, colour, texture, and every thing but position; those at Mhow overlie, but are entirely detached from their bed, (sandstone,) and the same quantity is scattered over a greater space than at Murka. Their exterior is jet black, and so highly polished, that it is impossible to examine them for any length of time when the sun shines, the great light and heat they reflect during the day is peculiarly distressing to the vision. The interior is a mottled dark, and light red, one view of which is conclusive of its volcanic origin. (Specs. 3 and 4.)

Nos. 5, are specimens also from Mhow, the originals, (spec. 5,) occur in very considerable masses, having both sandstone and clay as a base, and standing above it from 1 to 20 feet; the largest of these

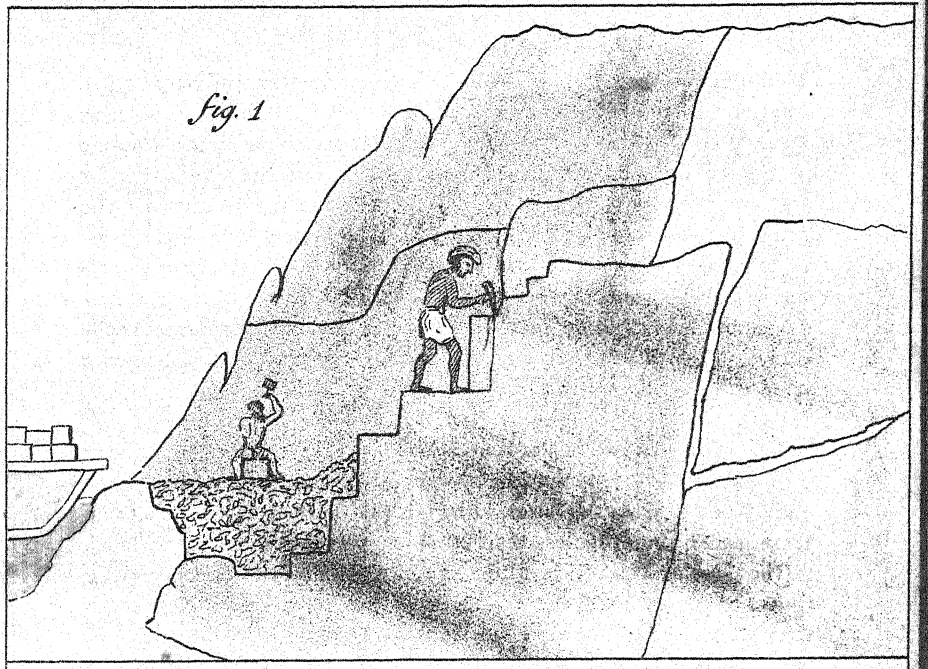


fig. 1

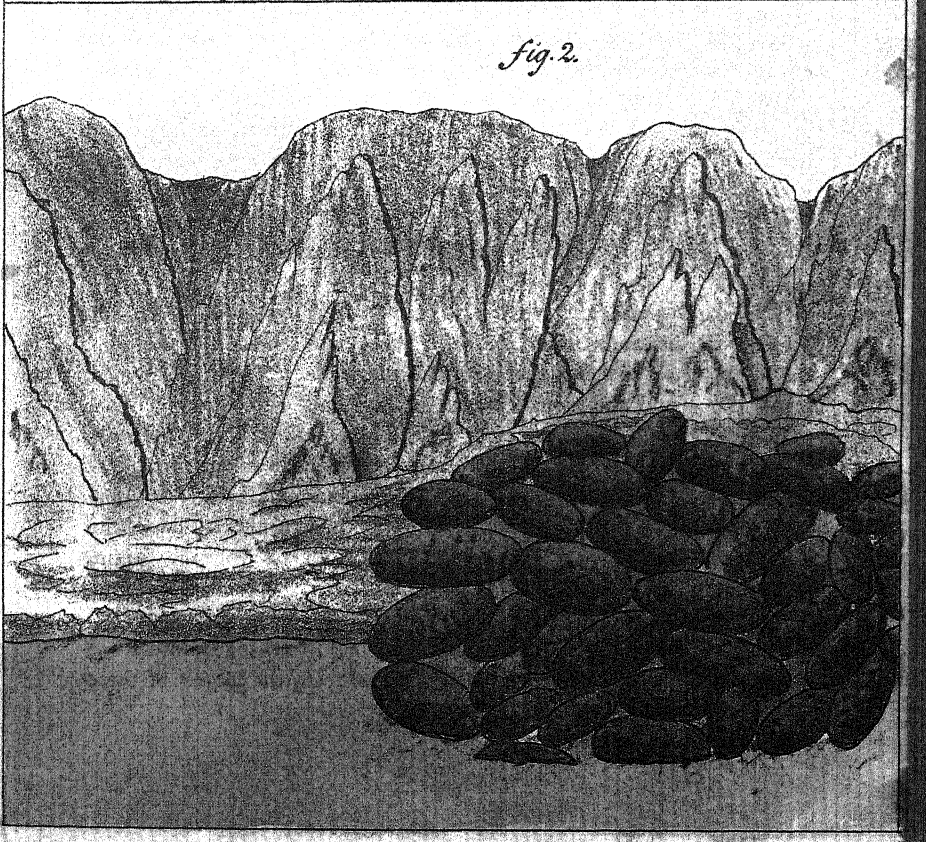
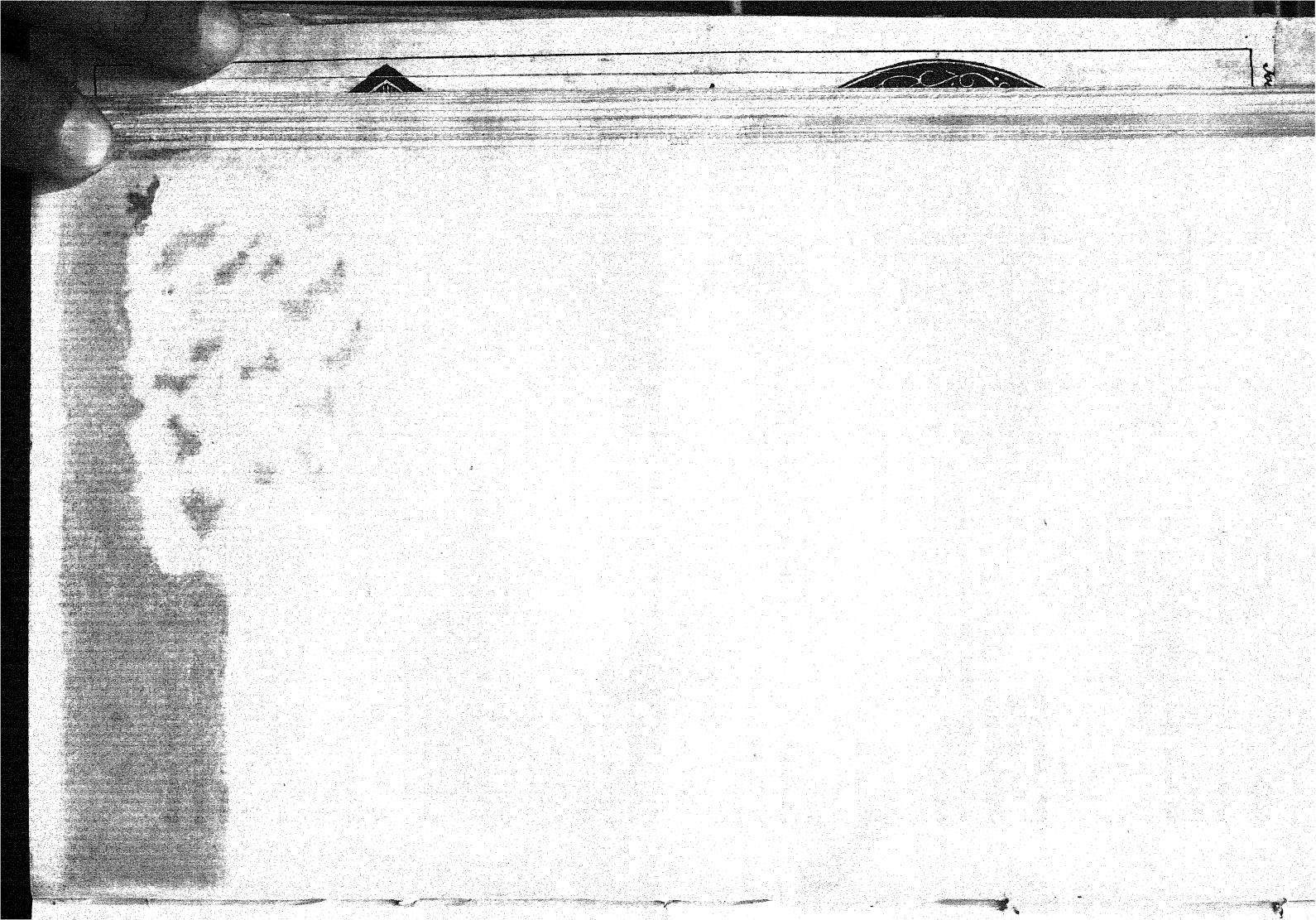


fig. 2.



masses is about 45 feet in diameter, of irregular shape and lighter color, than the detached masses, and evidently has not been nearly so much subjected to the action of fire as the latter; they are much softer, and have interstices filled with earthy matter, which has been subjected to great heat, but are only partially vitrified.

This substance either passes into unburnt clay of the 1st alluvial stratum, or the stratum of superior sandstone, on both of which it rests, (Specs. *c* and *d*.)

The singular appearance and conformation of the detached masses could not fail to attach something of the marvellous to them. Native tradition states them to be the stones which the army besieging Lunká, under Ráma and Lutchmun, were enjoined to bring for the purpose of building the celebrated bridge; but enough having been accumulated, messengers were despatched with the news, two of whom posted themselves at Murka and Mhow, two ghauts on the Jumna, and each, *Lungoor* and *Talah*, arriving with his load, hearing the welcome tidings, it was deposited here, and he proceeded lightly on his journey. I had this version from a Brahmin, who begged me, whilst getting my specimens, to remember that such relics should on no account be disturbed.

Of Isolated Masses, the Remains of Beds of Nodule Kankar.

Whenever these remains occur, the river is by their considerable extent generally contracted in its course, causing the water to rush through the narrow but deep passages between isolated masses of what was once one continuous bed.

The passage at Karim Khán (fig. 1, Pl. XVI.) (the point d'appine of the Jamna works,) is now and has been perhaps for centuries, solely affected by the presence of the remains of an extensive bed of nodule kankar, and is at the present moment the worst pass in the river for boats passing downwards at all seasons and upwards in the monsoons. As a description of this is applicable in its general outlines to every locality where these remains occur, I shall confine myself to it.

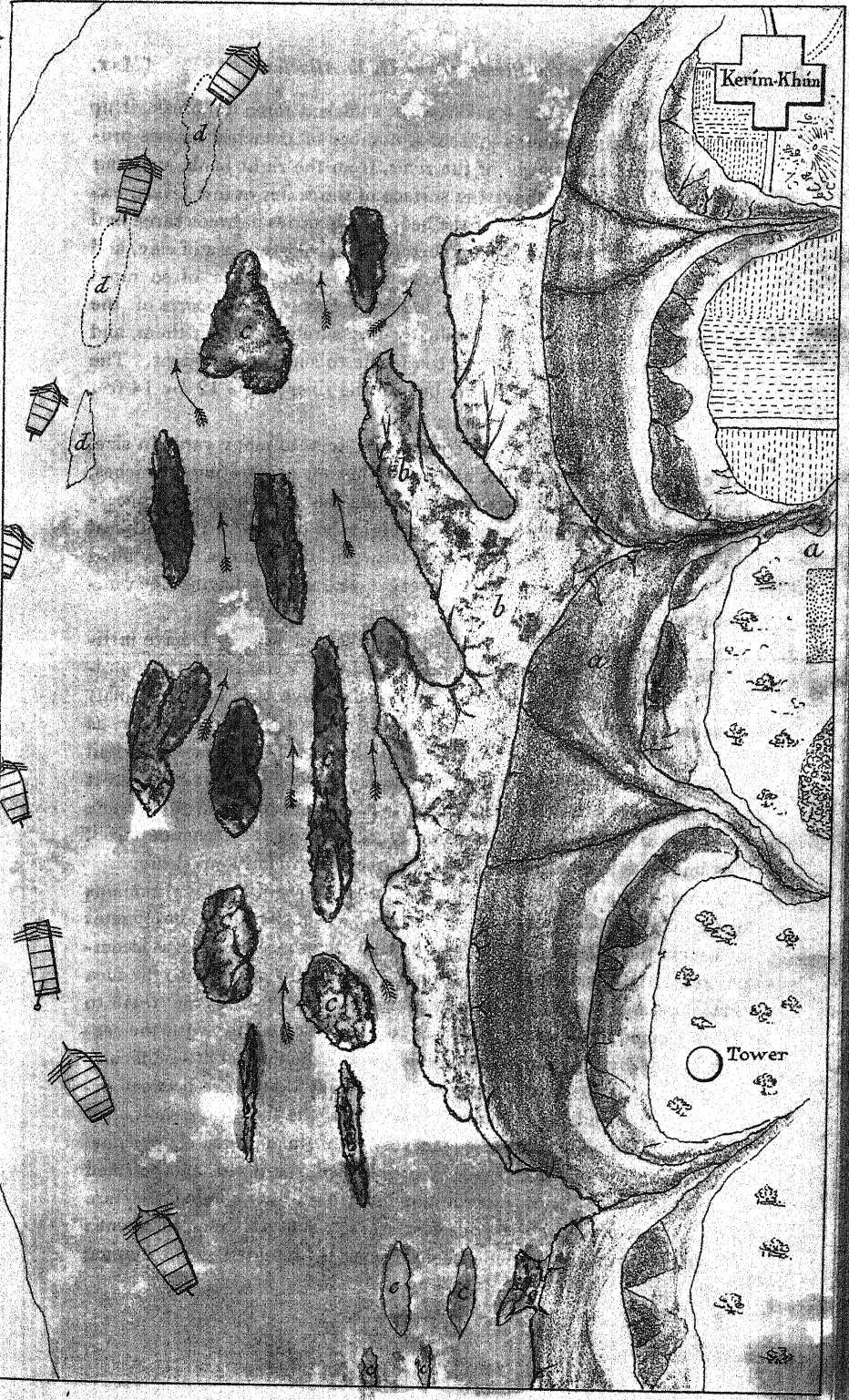
This bed has originally been and is still partially connected with and resting on the right bank of the river; its surface I imagine to be about 75 or 80 feet below the average level of the Bundelkhand bank, and the bed of the river to be about 16 feet below the surface. The left or Dúab bank is not above two-thirds the height of the opposite one, and is protected by a very extensive shingle shoal; had it been a bank on which the stream would have made any impression, the river would have certainly taken a course more free from impediments than the one it now pursues. The stream being thus confined, has, by the gradual deepening of the river throughout its course, been at last

thrown over this bed of kankar with sufficient force to break it up partially, and the remains present a number of detached masses protruding across two-thirds of the river, from the right bank, standing from four to five feet above the surface of the water at low levels, exposing the whole thickness of the bed, which varies between three and five feet, and an average of two feet of its substratum a stiff clay, and between them deep channels are worn. The action of so rapid a stream on all sides of these bases of clay (the supports of the superincumbent kankar) is gradually but surely reducing them, and in the course of time, becoming too feeble to support its weight. The kankar will be deposited in the bed of the river some 12 or 14 feet lower than its present position.

These masses, which vary from a few feet to many yards in size, are externally very compact and hard; but on penetrating 18 inches, it will be found, that they maintain inside this crust a similar appearance and quality with any bed that might be opened in the centre of the Dúáb, namely, the interstices between the nodules being filled with a loamy clay, and having every appearance of having been undisturbed since the formation of the bed.

It was on the strength of the unsuccessful search I have instituted in and under such strata as this, that I hazarded the opinion that I should consider the slightest discovery of fossil (animal) remains at a level corresponding with the deepest parts of the river, as the merest possible accident: perhaps I should have rather said, fossil remains may possibly be found in the Dúáb general alluvium; but it must be under parallel circumstances with those producing the Jumna fossils, as it is impossible to suppose that during the accumulation of this immense formation that such a space was void of animal life.

The question mooted by GRIFFITHS in speaking of the fossil remains of elephants, "Can we suppose that none are buried there (in climates to which the elephant is native), or that the bones have been decomposed by the force of heat;" chimes so much in tune with the idea that possessed me on examining every excavation in the Dúáb to which I could get access, previous to being acquainted with the section formed by the Jumna, that even now I should feel little difficulty in asserting, that unless some sufficient body intervenes between organic remains and the decomposing power of the sun's rays, soon after their assuming a morbid state, no vestige of them ultimately remains. Experience has proved that they are buried, fossilized, and petrified within the limits of this general alluvium; but in my opinion they are not even cotemporary with this formation, but of a date more recent: for with such an ample section before us, as is presented by the Jumna,


Kerím-Khán
Tower
a
b
c
d

would it be possible, where from the presence of strata of the secondary series, the complete section of the alluvium must be exposed, that within the limits I have examined, not one instance of fossil remains has occurred imbedded in it? To what cause then can their absence be attributed, but that they have been decomposed by the force of heat, before they could attain a state necessary for their preservation? To what then do the present specimens owe their existence? I must suppose either to the interposition of some body (water for instance) between them and the sun's rays, or to their having been petrified in the colder latitudes of the Himálaya, and lodged in the situations from which they were procured by the action of the current.

The fact of their being found in every stage between freshness, fossilization and petrifaction entirely excludes the idea of their having been uncovered by the deepening of the river having washed among any portion of the secondary strata, by which they would have been exhumed from the stratum in which they had been petrified: had the petrifaction taken place there, they must have all occupied that position from the known age of the general alluvium; a sufficient time to have been all alike or nearly so, which is not the case.

The following observations made on the conglomerate formation may throw some light on the subject.

The Conglomerate Rocks,

Are composed of nodule kankar and extraneous substances—and consist of two separate formations, both of which are strictly mechanical, together composing one-third of the rocks of the Jumna. Their difference consists in one formation being consolidated by means of cement, the other by the intervention of carbonate of lime deposited whilst in solution in all the interstices of any mass, thus connecting the whole together.

Before proceeding further, it will be necessary to explain how these nodules of kankar and extraneous substances are accumulated, and then show the method of application of the consolidating bodies. In all the high and nearly perpendicular banks of the Jumna, ravines are cut out by heavy runs of water at short and irregular intervals, which serve as drains to the surrounding country. During the heavy periodical rains, considerable bodies of water rush through these ravines with great violence, bringing down drift wood, rubbish of every description, nodule kankar, and large portions of clay detached by the water from the sides and beds of the ravines. The latter generally arrives in the river rolled into figures varying between a prolate ellipsoid and spheroid, (spec. *z*,) of all sizes, and from 20 lbs. to $\frac{1}{4}$ of an ounce in weight. The clay being softened in its rolling progress,

attaches to its circumference every substance hard enough to make a sufficiently deep impression to secure its hold; this continues until every portion of the outer surface is covered, when, of course, the accumulation ceases; in this state it is washed from the ravine into the bed of the river, on reaching which, it is carried forward in a new direction of the current of the river, which deposits it in the nearest hollow in its bed, where after lying a sufficient time, the body disunites; the lighter earthy particles are swept away by the stream, whilst the clay kankar, and other substances which may have been brought down with them, remain as deposited there: thus are all the necessary ingredients at once provided for the formation of a conglomerate rock except the sand, which in the course of a few hours generally proves the most abundant article of the composition, when only a sufficient time for the cement to set is necessary to present a rock, which the carbonate of lime (which fills all interstices that may be left) ultimately renders the hardest, and from their situation, very frequently the most dangerous rocks of the Jumna. (Specs. 6.)

The conglomerate in which carbonate of lime is the consolidating medium is generally produced by the breaking up of the beds of nodule kankar, by the supporting pillar of clay (its substratum) being washed away, or other causes, the loose or interior nodules, of which are then deposited in the nearest hollow lower down the stream that can detain them, when from the absence of clay (excepting this dislodgement occurs in the monsoon), the cement cannot be produced, and the deposit remains until by the usual process of tufa formation, the whole becomes one consolidated mass, (spec. 8,) this, however, must be the work of time, during which, sand often fills many of the interstices, and becomes a part of the conglomerate body.

The fractured edges of remains of nodule kankar beds often present this formation, although from the difficulties it has to encounter, a very small proportion of the conglomerate rocks of the Jumna belong to this class. The principal tufa formation that I am acquainted with, was removed by Lieut. MARTIN, Engineers, from near the village of Orowal, where the accompanying specimens were collected. (Spec. 8.)

Most of the specimens in your hands, Sir, will speak for themselves. I select, however, one instance of the cement formation, in which the fossil remains of an elephant are imbedded, which I consider, claims a particular description.

The site of the mass containing these interesting remains on the right bank of the river, about 12 miles from Korah Jehánábád on the high road to Cawnpur, directly under the village of Pachkowrie, which stands nearly 80 feet above it, lying amongst an immense as-

semblage of kankar deposits of various ages and appearance where it is conspicuous by its size and thickness*. The bank on which these have been formed, is a portion of the first alluvium stratum.

The existence of these remains, in the position they occupy, bears me out in the assertion that one-third of the rocks of the Jumna are of a mechanical formation, and some may even possibly date their formation within the memory of the present generation, that are now some feet in thickness, and of very considerable extent; others only in embryo which may, on arriving at their full size, be able to turn the course of the river. As I imagine three feet to be the maximum, and half an inch the minimum, thickness in ordinary cases of any layer deposited in one monsoon; for at this season only does it receive any considerable addition: the product of a heavy shower or short continuance of unseasonable rain, I imagine to be very trifling; the ground being generally in so parched a state near the banks of the river (where the drainage is so rapid and complete), that an ordinary shower is absorbed, or nearly so before reaching it, producing no other effect than a run in the deepest parts of each ravine, which ceases almost as soon as the shower.

Others, however, of the same formation are entitled to be considered of proportionally great antiquity; for if my position be established, that it is to some peculiar quality of the water, combined with the other consolidating bodies, we owe not only the majority of the rocks of the Jumna, but the organic remains that have been or may be discovered, there must be some instances of both existing, whose ages must be coeval or nearly so with the river itself, as the same causes must always produce the same effects, and once produced, their positions and appearance may be altered; but the greater their age, the more combined and natural do these substances become, until their appearances present so little in consonance with conglomerates of the most ancient structure, that nothing, but an examination equally minute with that I have bestowed on the subject, can distinguish between them. Those having pretensions to antiquity are the ones occupying levels to which the river seldom now ascends, and never continues at such heights more than a few hours together, with others quite out of the reach of the present highest levels.

In the specimen before us, the form of each bone in its position in the deposit has been accurately preserved, but not in a state in the slightest degree approaching what it would have been, had they been exposed to the uninterrupted action of the water, which proves that

* The plate referred to here in the MS. is omitted.—Ed.

the animal has either died in, or has been after death washed, to, the position it now occupies, on which the deposition of kankar and other substances has still continued, thus rapidly enveloping it in a crust, which accounts for the absence of petrifaction, (specs. *a* and *b* ;) for I have observed that in very few instances, where organic remains have been imbedded in the kankar deposit, has the bone materially differed from the present specimen. Instances have occurred, and still may be referred to, as existing at the present moment, whereon the deposit having attained the highest level of the river, or from the sinking of the river in its bed, it has been left at a level scarcely ever attained now at its highest rise; where the formation has necessarily ceased in these cases, those bones which with other extraneous substances help to form the upper crust or surface of the deposit, are generally from their being larger than the nodules of the kankar, but partially imbedded; that part which has been exposed to the action of the water, is perfectly petrified, and is rather darker than the surrounding kankar: whereas the part below the surface maintains the same colour, appearance, and quality, (fossilized, but not petrified,) as this specimen or nearly so, allowing for the difference in the size of each, (spec. 7,) and the proximity of the petrifying medium to the former, which, I consider ample proof of the rapidity of the formation ; as, if the process was slow, many instances must occur of bones or wood in a thoroughly petrified state, being met with imbedded in these masses. I have found, however, nothing approaching nearer a state of petrifaction than specimen Nos. 7, which are completely fossilized, but not petrified.

Another proof of the rapidity of the formation is, that the interior is not much more consolidated than the interior of a bed of loose nodule kankar, and the only difference between them is, that the interstices between nodules in the latter are generally filled with loamy clay, whilst here sand occupies its place.

The antiquity of this particular specimen must be very considerable, as I question if the upper parts are covered during the highest levels. The river has deepened its bed abreast of it about 25 feet, which even supposing it to have never occupied a higher level than at present, which cannot of course be now ascertained, precludes the possibility of any addition having been made to it for ages.

Numerous instances of organic remains occur in other masses of different deposits lying in all directions round it, but the grand scale both of these remains and of the mass in which they are imbedded, completely throws them into the shade.

The sides of the mass presented to view in the accompanying sketch* are evident fractures caused by the breaking up of the field by the deepening of the river in its course, and although the present mass is of the largest dimensions met with of this formation, I have no doubt it forms but a mere particle of the field as it originally stood, the remains of which now occupy various isolated positions in the river abreast of it, which run across two-thirds of the whole breadth.

Many other observations might be made on this deposit (and this specimen of it in particular), that do not now occur to me; but they will readily suggest themselves to some more intelligent visitor, who may be induced, from these remarks, on passing the spot, to give it an hour's examination.

As I believe no instance is on record of any other organic remains than shells having been found in those strata of kankar opened in so many parts of the Dúab, in excavating wells, and for the purpose of being burnt into lime, &c., the conclusion I draw from the observations I have been enabled to make, are all in favour of the opinion given in my letter of the 2nd of August, that I do not consider the fossil remains of the Jumna, as at all connected with the natural kankar formation, for wherever the specimens hitherto collected have been found, circumstances quite as conclusive as those above pointed out attend to shew that only these mechanically formed masses are in the slightest degree connected with the fossils, and that the formation is decidedly confined within the action and limits of the river, either past or present; but very possibly similar ones may be met with in parallel situations in other parts of the Dúab, generally alluvium, as yet unrecorded.

In your note on the Narsingpur fossils, I consider A A, the rocks in which the bones are imbedded, to be a most accurate description of the deposit rocks in the Jumna, if kankar was substituted for rounded pebbles: of course, this difference the localities of these specimens has alone effected, as the distance from the hills (which alone could supply rounded pebbles of the Nerbadda, at Narsingpur) is so much less than the Jumna at Pachkowri†.

* A rough pencil sketch is here given in the MS. of the mass of kankar "of the deposit formation," containing the fossil elephant near Pachkowri; it lies 4½ feet above water-mark: the description in the text has been deemed sufficient without the plate.—Ed.

† This conglomerate varies its character according to the rocks which have supplied the rounded pebbles of which it is composed; these are sometimes granite, sometimes kankar, and sometimes jasper or vitrified clay.—A description of extensive deposits of it in the Rájmahal hills will be found in the extract from

The position too of the rocks shewn in section, (fig. 1, Pl. 21, of Vol. II.) as containing fossils, is such, as I should have given them, had an elevation of the bank of the Jumna been required of me. Of course, I have had no opportunity of comparing the specimens from the above places; but from their general coincidence in position, and the fossil remains found in each, I am led to believe an intimate connexion exists between them in date, formation, and structure, and if, Sir, you think I have satisfactorily shewn the system of the deposit kankar formation in the Jumna, I think the same description would apply to similar formations in the Nerbadda.

3rdly. Of the Kankar Shoals.

These are composed of every variety of substance that is ever in motion in the Jumna, the most common of which are broken bricks, bones, shreds of earthen vessels, wood, fragments of granite, sandstone, quartz, agate, water pebbles, petrified clay, and composition shingle, of every variety of mixture that the clay of the surrounding country and sand of the Jumna will admit of. This last bears a proportion of four-fifths to the whole, which being mistaken for kankar, (of which the quantity is very trifling,) has occasioned the misnomer of kankar shoals.

It is among this heterogeneous assemblage of substances, that the best specimens of petrifaction are to be found. Bones, however, in every stage between freshness and a state approaching the hardest stone are procurable by turning over the surface about a foot deep; but I imagine, in fact I have ascertained, that not only more perfect, but a considerable abundance of the best specimens would be found at greater depths; as, during levels of the river sufficiently high to cover these shoals, the fragments near the surface are subject to violent attrition, and bones and other fragile substances, to total demolition, from the masses which are at such times continually rolling over them. Numerous instances occur in some of these shoals to support

BUCHANAN'S MSS. published in the GLEANINGS, vol. iii., where also its characteristic of containing "giants' bones" is preserved in the very name of the place, *Asurhár*:—this circumstance has been brought to our notice lately by Mr. STEPHENSON, who has lately learnt that a gentleman at the Burdwan colliery has collected a number of fossil bones, and shells from the sides of other hills of the same range. Being very anxious that this field should be again and more thoroughly explored, we have republished the passage from Dr. BUCHANAN on the cover of the present No., and would direct the particular attention of our correspondents at Monghyr, and of the engineers engaged on the Rájmahal canal survey, to the whole line, which will probably prove as prolific as the Nerbadda or the Jumna. It may also afford proof against Mr. DEAN'S account of the formation of the conglomerate, and introduction of the bones within it by the action of the river.—ED.

the opinion before advanced, namely, that the force of heat is capable of causing the decomposition of bones, unless shielded by some intervening substance, applied during a state of freshness, and continued up to a certain period, the time of which must vary according to the quality of the bone; but my experience does not enable me to set bounds to the time necessary to render one of any quality proof to the effects of the sun's rays. I imagine, the seasons may cause so much variation, that the exact time necessary for them to continue under this protection, cannot be better defined than between the time of their deposition in a state of freshness, and the extinction of every animal or vegetable property, when they become nothing more than consolidated earth; (see specimens, the remainder of a pípal tree, Nos. A 3,) and even in this state I am led to believe, that exposure to the sun would cause decomposition, and to this, as well as to the effects of attrition, must be attributed the very few perfect bones found in these positions. I once found the femur of a camel, the middle of which was covered by a large damp stone, the portion covered was perfectly petrified in its whole circumference, whilst both ends were decomposed; but the absence of fossil remains in the whole section of this general alluvium is more conclusive than any minor proofs that can be adduced.

Very few specimens of wood occur in these situations. To the reasons advanced in explanation of the imperfect state of the bones is to be added the greater degree of brittleness of this substance in a petrified state. I have never procured more than three specimens from the kankar shoals, which I will forward with the other specimens of the collection.

Petrified clay (Specs. 9,) is found generally in small portions, and is transmuted by the same process as the earthy substance, to which wood is reduced previous to petrifaction, (spec. A 3,) which to all appearance has every property of indurated clay, the specific gravity of each being nearly the same.

Composition shingle, or cement pebbles, are produced by the admixture of clay or sand in almost every proportion of each: the most common process of the formation is as follows:

After a heavy shower, the water in its passage through the ravines near the river brings down with it clay in the shape of a thick sediment; this in many instances, after leaving the mouth of the ravine, has to run over large sand beds before it reaches the river, through which any considerable body of water cuts deep passages or gulleys, which run nearly horizontal 10 to 20 yards, and then fall 4 to 12 feet; running on again, they fall and run on irregularly, until reaching the

river. When the principal body is passed, the sediment becomes thicker, and dropping over these falls, mixes with the sand of the horizontal run beneath, forming first a single irregular mass on the upper side, whilst the under is pretty irregular, and of a rounded form: in this at first the sand predominates, the sediment continues dropping and adding to the stone, until all the sand within reach has been sucked in, when the formation ceases, and all the sediment that continues to fall on the same spot, adds nothing to, but merely rests on the composition, and is washed off by the next run of water, leaving a perfect stone. Six or eight stones are very frequently formed in this manner, of different shapes and varieties of composition, under the same fall, which is entirely regulated by accident; in some of these sand predominates, (specs. 10 and 11,) in others clay: again, the composition consists of nearly equal portions of each. One fall may produce 10 or 12 stones separate, which another run of water may from the sediment falling on a layer of sand deposited since their formation unite, thus forming one stone, (spec. 12,) the difference between the first formed and their cement being very perceptible. The cement becomes set and as hard as dry mortar in two hours after the mixture has taken place, and after three days' exposure to the sun, they attain the substance of stone more or less hard, according to the justness of the proportion of the composition; these stones being generally round, are more frequently in motion than any other substance, and is owing to mistaking them for natural kankar, (I say natural, as I believe the substance to be kankar, of mechanical formation, the same ingredients forming in my opinion both,) that the term kankar shoals has been applied.

Of the Sunken Trees.

This dangerous obstacle to navigation is so well known from its occurrence in almost all navigable rivers, whose banks are covered with wood, that little need be said of it here.

The trees have originally occupied a position on the verge of the bank, which the stream having undermined, they have fallen into the river, with a quantity of earth attached to the roots, the weight of which firmly anchors them to the bottom, the head laying with the stream. In the Jamna any portion visible above the lowest levels is cut off to the water's edge by the inhabitants of the nearest village, leaving the bluff stumps of the large branches in the most dangerous position possible, at average levels. In 1833, the whole of these between Agra and Allahabad were sought for and taken out, and by the precautions then taken by the superintendant, it is next to impossible that any other instances can occur for many years, as every tree with-

in a certain distance of the river has been cut down, and others still farther back marked for the same purpose 10 or 12 years hence.

A few may perhaps be drifted out of the Chambul and other tributary streams, but of so little consequence from their small size (the large and dangerous ones lying where they fall), that this obstacle may be said to be almost entirely surmounted.

Description of a cluster of four palms and a pípal tree. These remains have belonged to trees once growing on the general level of the Bundlecund bank, which having been sapped by the stream, they have slipped down with the earth, in which they grew, in the manner represented in sketch No. 7, (7. fig. 1. Pl.)* The pípal having been nearest the river has fallen lowest, and according to their distance from the edge do they now occupy their present positions, forming as it were a graduated scale, proving more strongly than any other instance I am aware, the petrifying qualities of the water. All I could write on this subject would not be so conclusive of this assertion as one glance at the specimens, which I shall merely describe.

A is the bark of the pípal stump, five feet in diameter, and about 14 feet long, lying on a sloping bank, with the root towards the river.

A 3 are portions of the body or trunk, which is reduced to that state, which I conceive necessary for any substance to attain before petrifaction commences, viz. a total extinction of all its animal or vegetable properties: whether the wood is actually changed into stone, or the gradual formation of stone merely destroys and takes its place, I am not able to decide; I can only say, when once properly petrified, the rings, the marks of annual growth of the tree, remain as apparent as when in a vegetable state.

A 2 roots of do. in a similar state to A 1.

B remains of the palm No. 1
C do. of do. No. 2
D do. of do. No. 3
E do. of do. No. 4
} of sketch No. 7.

The very apparent difference of texture between specimens Nos. 1 and 4, is caused by the former lying lower; it has been more frequently exposed to the action of the water than the latter. Nos. 2 and 3, occupy intermediate levels.

In adopting the term "petrified," as regards the palms, it is necessary to observe, that the striated fracture precludes the idea that this is the wood, the grain of which would be longitudinal, and confirms it as a tufa formation, enveloping the several parts of the tree exposed. Still I imagine, there are sufficient portions of fibres really petrified, to warrant its being applied as a general term to these specimens.

* We have conceived it unnecessary to insert this sketch.—Ed.

P. S. I have found on comparison that I had come to wrong conclusions, with respect to some of the vertebræ, I had the honor to send with the last parcel, of which opportunity I availed myself to send all of which I had the least doubt. The teeth too, which I have hitherto called camel's, cannot have been rightly classed, as they bear not the least appearance of having belonged to the existing species, at least, the evenness of the crown differs entirely from any anatomical specimen to which I have access.

I should have forwarded the whole of the undermentioned specimens before, but obvious reasons induced me to wait the present opportunity.

List of specimens illustrating observations on the obstacles to navigation in the Jumna, forwarded from Delhi, 22nd October, 1834.

A, B, C, D, E. Specimens of the remains of a cluster of one pípal and four palms.

F. Parcel containing 10 specimens of petrified animal remains, viz. Nos. 2 and 3, teeth. Unknown.

„ 14 portions of Asiatic elephants' jaw and tooth.

„ 38 and 39, upper extremity of femur and kneepan.

(Of these I had myself no doubt, as having belonged to a camel; but some doubt having been expressed in another quarter, I have left it to your decision.)

Nos. 40, 41, 45, 48, 49. Vertebræ.

x. Specimens of pipe kankar.

y. Supposed shale.

z. Rolled clay connected with the formation of conglomerate rocks.

a and *b*. Fossil remains of an elephant from Pachcowrie. Femur and enamel of tooth.

c. Specimens of clay passing into or vitrified clay.

d. Specimens of sandstone passing into ditto.

1. Fine sandstone from Burriarie.
2. Coarse ditto, from Mhow.
3. Specimens of vitrified clay from Murka.
4. Ditto of ditto, from Mhow.
5. Ditto of ditto, from ditto.
6. Cement formation of conglomerate rock.
7. Tufa ditto, of ditto, containing blade bone of camel and other animal remains.
8. Specimens of outer edge of beds of nodule kankar, conglomerated by carbonate of lime.
9. Specimens of petrified clay.
10. Composition shingle, in which sand predominates.
11. Ditto ditto, in which clay ditto.
12. Ditto ditto, of separate formation, cemented into one mass.
13. Specimens of sandstone peculiar to the Jumna.

NOTE.—We intended to have given plates of the principal fossils forwarded by Serjeant DEAN, but the friend who had kindly undertaken to draw them has been prevented from accomplishing his task in time; we must therefore reluctantly postpone their insertion and notice.—ED.

V.—*Note on the Gold Washings of the Gúmtí River. By Lieut.* CAUTLEY, *Beng. Art.*

In the 18th volume of the Asiatic Researches (Physical Class), the occurrence of gold in the line of mountains skirting the foot of the Himaláyas has been brought to notice by Captain HERBERT, and as in his specification of the points where it has been found, he has drawn our attention chiefly to the Rámgunga, and its tributaries east-ward of the Ganges, and has not noticed the tract of mountains upon which the town of Náhun stands: and as in the system adopted by the natives in washing the sand, as described in the paper alluded to, there is some difference from that of the Náhun washers; it will be perhaps interesting, not only to bring forward this new locality, but also to shew the simple means adopted in procuring the mineral.

The late grand discoveries of organic remains in the hills under Náhun, and the consequent desire of prosecuting the inquiry as far as means would allow, have like many other searches led to the discovery of an object of a totally different nature from that in pursuit; nor may we be far wrong in agreeing with Captain HERBERT, that the ultimate discovery of gold in abundance in these regions will eventually either benefit some fortunate individual, or else come at once under the eye of the ruling power of the district.

I will however enter upon the subject of this note, previous to discussing the probabilities of discovering the ore in situ.

The rivers from the beds of which the sand containing the ore is procured derive their sources solely from this lower tract of mountains, and are not in any way connected with the Himálayas! There does not appear to be any river free from the ore, although many of them are considered by the washers as more abundant than others, and consequently more worthy of their labor: that to which I shall particularly refer is named the Gúmtí river, which leaves the mountains at the village of Chúran; Gúmtí being the name of two villages on the right and left of the stream, about three miles in the interior, at which there is a main junction of tributaries; the river opens into the plains opposite to the town of Sidoura, to the westward, and parallel to the Choura Pani and Markunda river, which carry off the greatest portion of the drainage from the hills directly under the town of Náhun.

The gold-washers are by no means numerous, and are of the poorest class, depending entirely on their trade for support. The Rájá of Náhun levies a tax of a *masha* per annum on each trough: but although there is no restriction to the number of people employed, as long as this

toll is paid, there does not appear to be any desire or competition on the part of the natives to carry it on, by which we may draw a tolerably accurate conclusion on the returns of the trade as it now exists.

The apparatus used by the washers consists simply of a trough, a sieve made of the Sirkunda grass, a flat piece of board, with an iron edge for scraping up the sand, a plate or dish for carrying it away, and triturating the sand with mercury, and a ladle or spoon made of a gourd, for raising water: with these and a little mercury in the end of a hollow bambu our gold-washer starts on his pilgrimage. I have endeavoured in the accompanying sketch Pl. XVII. to give some idea of the process, and this will perhaps be clear enough without much explanation. The gold washer, in the first instance, examines the soil by washing a small quantity in his hand, the smallest particle or particles of the metal are easily detected: the soil holding the greatest quantity appears to be that in the line upon which the drainage of the river takes place, for these mountain streams occupy but a small space of their channel during the dry months, or even at any time, with the exception of those periods, during the rainy months, when very heavy and successive falls of rain charge every channel with its full supply. The situation proving favorable, the washer then establishes his trough; the sand is placed on the sieve, and water thrown over it with the spoon: the coarser particles are thus separated and thrown away; the man still continues pouring water through the sieve over the sand in the trough, until nothing remains there but an almost impalpable blackish powder; in this powder the gold dust is perceptible. This powder is then collected and taken out of the trough, forming a mass capable of being held in both hands: this is triturated with a small quantity of mercury on the dish or basin B, and the whole is again subjected to a careful washing with the hand on this dish: this latter washing removes every thing, but a small piece of mercury and gold in amalgam. The gold-washer then lights a piece of cow-dung, upon which he places the amalgam, and (as far as I observed in their manufactories) his labor was repaid by the smallest piece of the precious metal imaginable. The rains are said to be the best and most profitable season: at this period, two rupees per day may be the return of one trough under a gold-washer and one assistant, the worst day's produce about two annas; the gold is either sold to the *buníás* at the large towns in the neighbourhood, or given to zamíndárs for an equivalent.

There is a great loss of particles of the gold in the system of washing adopted here, many of which must pass off through the trough; there is also a total loss of mercury: the latter might be easily reme-

died, we should imagine, were the washers in the habit of giving the amalgam to their employer, who might complete the process in close retorts. It is evident that under the eye of an active and interested person, a trade might be carried on here of a description by no means contemptible: a much greater quantity of the mineral might be procured; and that on the adoption of a trade in the article, an improvement of the apparatus might be effected, tending much to that point. I have much pleasure in sending you three packets.

No. 1, containing the sand as found in the bed of the river.

2, the black powder, the result of the first washing in the trough.

3, the gold ore; and shall hope to see your note on the quality as well as the natural state in which the ore exists: it would appear from the account of the washers that lumps or larger particles than those sent are not found, although it is by no means an easy matter to get correct information on points of this sort*.

That the gold exists in any other shape than that of the present specimen in these lower mountains is very improbable. The particles may differ in size; and we may in all probability detect the stratum containing the gold dust, and so procure it before it has undergone further attrition in the river's bed; but we must look to the Himaláyas themselves for the auriferous strata, from the disintegration of which the sands of these lower hills have been supplied with the mineral. Captain HERBERT alludes to the occurrence of the ore having been traced up to a certain point in one of the tributaries of the Rámgunga, a fact corroborated by Mr. RAVENSHAW of the Civil Service, in a note to the Society. My inquiries establish a similar limit in the Gúmtí river: this is a point, however, that would require very careful examination, and that examination under the eye of an experienced person, who, after all, in such a maze of mountains and rivers, would perhaps have to depend upon chance for successful prosecution of his labors.

The occurrence of gold in alluvial soil is common to every quarter of the globe, although South America and Africa provides the greatest supply of commerce, and in all probability there is no extensive chain of primary mountain that does not charge its drainage with the mineral in question! Its incorruptible nature, and its not being subject to the

* These have not yet reached us. The black powder is however doubtless similar to that which accompanies the gold dust in the rivers of Assam and Ava:—for the most part magnetic oxide of iron. Platina may also be found in it but rarely. The use of a strong magnet would perhaps prove advantageous, before rubbing in the mercury for amalgamation.—ED.

effects of oxidation from common causes, is a sufficient reason for the presence of this mineral, unaccompanied by others*.

With regard, however, to the Náhun and Rámgunga gold, we are perfectly decided on one point, viz. that the rivers bearing the dust have no connection whatever *now* with the great Himaláyan chain, and therefore, that if the mineral exists in abundance at any one point, it will be found in the hills from which these rivers derive their sources; and it is to be hoped, that we may even look forward to the ultimate discovery of gold in comparatively as great abundance as the present fossils, the existence of which, six months ago, would have been as much doubted as the possibility of finding gold now may be.

Northern Duáb, April 10th, 1835.

VI.—*Notice of the Nipálese Spirit Still. By* A. CAMPBELL, *Esq. M. D. attached to the Nèpal Residency.*

The accompanying (Pl. XVII.) is a rough sketch of the still in universal use throughout the valley of Nèpál Proper, as well as its neighbouring hilly country; and so far as I can learn in the portions of eastern Thibet, usually visited by Nipálese traders, on the beaten commercial routes, by the Kerún and Kuti passes of the Himálaya, to Digarchi and Lhássa. I believe it to be as different from that commonly used in the plains of India, as it assuredly is from any with which I am acquainted as existing in European countries, and as its use is confined here chiefly to the Newár population, it needs no apology for intrusion on the public attention.

In India, (so far as my recollection is faithful,) Nipálese men, manners, and things are regarded, as pertaining exclusively to the ruling class of the community, yclept Gúrkhás; this arises partly from want of better information on, or curiosity regarding, Nèpál affairs; partly from the common habit of identifying the whole people of a country, with the few, who may for a time direct its destinies, but chiefly from Nèpál being best known to us, as the theatre of a two-years' war between one power and the afore-mentioned tribe.

The Newárs, as is well known, were down to the Gúrkhá conquest the rulers of this valley, and were, as far as at present ascertained, its

* In the specimens from the alluvial soil of the Brazils, the particles of gold are much larger than those found in the Náhun sand, appearing like little boulders, or rounded masses of the mineral. In my cabinet the Brazilian alluvium is clay, or argillaceous matter, with rounded pebbles of white quartz. Mr. MAWE having provided the specimen.

original inhabitants*. At the present time they form the great mass of the agricultural and artisan population, and the ruins of their well-built temples and towns painfully manifest the giving place of their civilization to the rude and barbarian horde of mountaineers who now consume in military idleness the fruits of their fertile fields. Like other tribes of the human race, the Newárs have lost their day of progress, and little remains to them now, save their eminently industrious habits, and a skill in agriculture far exceeding in efficiency that attained and practised in the neighbouring plains of Hindústán.

The fate of the Newárs, and the many good qualities by which they are distinguished, renders all connected with them of much interest. Their original country, previous to their advent in Nèpál, remains as yet undecided. The decidedly Tartarian cast of their physical form, and monosyllabic structure of their language, makes Thibet claim them as her's. The most popular fabulous traditions of the race point to India as the source of their existence, while the religious creed as a means of arriving at a correct knowledge of their origin has, as yet, I believe, proved defective†.

The manners and customs of a people, when known, go far to shew the intimacy of connexion with neighbouring countries; and, I believe, that were those of the Newárs (in such purity as they existed before the Gúrkhá conquest) taken as an index to their original country, few links of close connexion would remain to bind them to India, while many and strong ones would shew their Bhoteah origin.

The still, then, as an instrument of universal use, supposing it unknown in India, and to be the only one used in neighbouring Thibet, will go for something (trifling enough it is true) in the enumeration of domestic usages; and I now return to it.

The furnace on which the still is represented as resting, while at work, is commonly the clay *chula* of India, or made of unburned bricks. The body of the still (*phúsi*) is of copper, and is seldom made to contain more than 15 or 20 gallons, and costs from 30 to 40 mohurí rupees‡. Over the open mouth of the *phúsi* is placed the portion marked (3) named *putasi;* it is of burned clay, about the same size as the body of the still, and has a circle of round perforations, each the size of a crown-piece, flanking the large opening at its base, as represented in (7) of the sketch. The junction of the *phúsi* and *putasi* being secured by a luting of moist clay, the receiver nam-

* See Mr. Hodgson's paper on the Aborigines of Nèpál Proper, in the Journal of the Asiatic Society, for May, 1834.

† It is calculated that about two-thirds of the Newár population of Nèpál are Buddhists, the remainder Brahminical Hindus.

‡ One mohurí rupee is equal to 12½ annas sicca.

ed *dúbli*, and marked (6) is put into the *putasi;* its base, corresponding in circumference to the large opening in the latter, fills it up completely, and leaves the circle of smaller holes free, for the passage of the spirituous vapour, to ascend into the still head, or *putasi*.

The receiver being placed as above noted, within the portion marked (3), the vessel (5), named *batta*, or condenser of copper, is filled with cold water, and placed over, and into the mouth of the *putasi*, or still-head, fitting so close, as to prevent the escape of any portion of the spirituous vapour from the latter. Thus fitted, the distillation is accomplished, care being taken to remove the condenser so often as is necessary to replace the water become warm, by colder, fit for the condensation of the spirituous steam.

The shape of the condenser suits the performance of its office; the vapour rising through the smaller holes around the receiver comes in contact with its entire surface, and being there condensed, runs towards the apex of it, and thence falls into the sub-incumbent receiver.

The still is charged, of necessity, previous to the fixing of the receiver and condenser, and these portions are removed at each fresh charge; the receiver being either emptied of its contents and replaced, or a spare one introduced.

At each removal of the condenser there is of course some loss from the escape of vapour, but it is trifling, as there are usually two of these vessels attached to each still, and thus the time occupied in replacing a warm condenser, by a cold, is very inconsiderable.

It must be admitted, that this process is rather rude, and it will be seen, that the construction of the still has not reference to the most approved principles for economising fuel. It is deep and narrow, instead of broad and shallow, yet it is very efficient; and it must be remembered, that the shallow broad still even in Europe is of very modern date, and the result of the severe excise laws, existing in our own, and more civilized countries.

There is one peculiarity in the working of this still, worthy of remark, and the advantages of which in saving fuel compensate in some degree for its rudeness. So soon as the still is in full play, and a portion of vapour has been condensed, and reached the receiver, a fresh distillation commences.

The receiver heated from below causes the spirits to be converted into vapour, which is again condensed, and thus a constant round of distillation is carried on between the receiver and condenser, in addition to the proper distillation of the contents charging the body of the still. Alcohol, at the specific gravity of 863, can be produced from this still, and I have used it with complete success, in making the

Gold washers in the Beds of the Rivers under Nahun, with the apparatus used.

fig. 1.

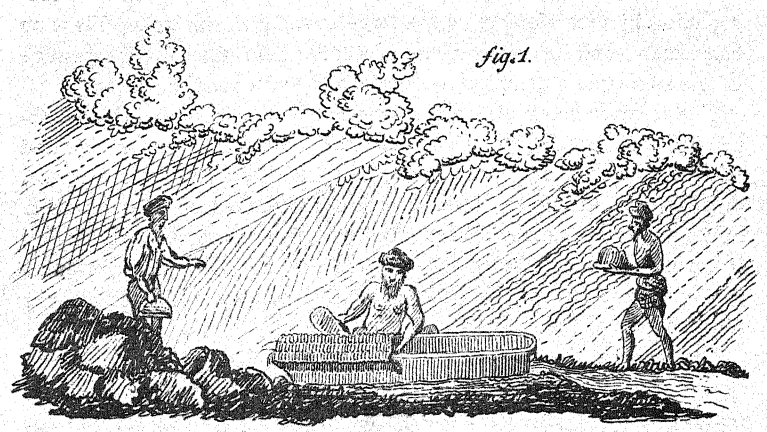
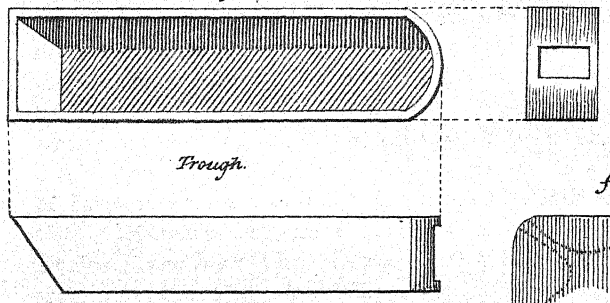


fig. 2.



Trough.

fig. 3.

Spoon or Ladle.

fig. 4.

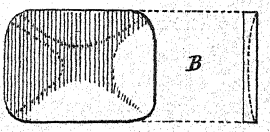
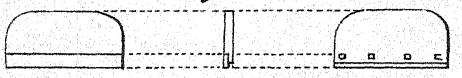


fig. 5.



Nipalese Still and component parts.

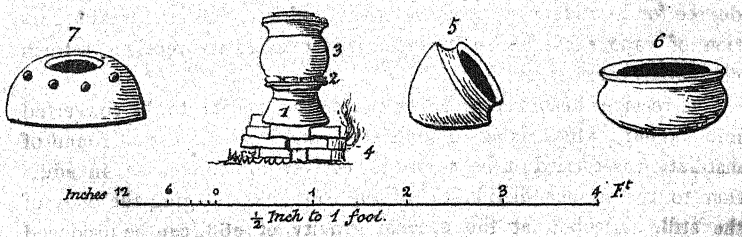
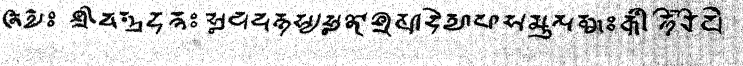


fig. 6.

Inscription on a piece of sculpture found near the Kesiah mound.



spirits of turpentine, and the residuum of yellow resin from the *Ganda Firoza* of Nèpál*, both of these articles, being equally good for medicinal and other purposes, as that to be had in Calcutta, and, I believe, much cheaper.

The ubiquity of this still throughout the valley arises from the freedom of distillation sanctioned by the rulers. Excise laws for whiskey-making are as yet unknown here, and were their executives to appear among the peaceable Newárs, I fear the fate of some of them might resemble that of ROBERT BURN'S man of this craft.

Every Newár, who can afford it, distils his own Rakshi (spirits from rice), and all the lower orders of this people, and many of the respectable ones, are greatly addicted to the use of spirits. They are not by any means given to habitual drunkenness, but they indulge for the good of their healths, regularly and moderately. In the rice-field, cold and wet as it is, the bottle is a great and ever present comfort; while at a religious meeting, or on the celebration of a birth or marriage, it goes merrily and rapidly round; males and females, young and old, alike partaking of it, to the increase of social happiness and joy in all.

Few sights in Nèpál are more grateful to the foreign visitor, than the feasts and merry-makings of the Newárs: on such occasions they congregate on some green and sunny spot, near a temple, or old image, with a running stream of limpid water passing through it, and there, for the live-long day, in the idle seasons of the year, do they sing, play on the musical instruments of their tribe, often dance and ever laugh, enlivened by the *rakshi* stoup it's true; but the mainspring of their joy is the cheerful and happy temperament they possess, to an eminent degree, in strong and pleasing contrast with the sour looks and arrogant demeanour of the Gúrkhás, or the melancholy and apathetic countenances of the inhabitants of Hindústán, who sojourn for a time among them.

Reference to Plate of Still, and its component portions.

Names in Newári language.		English synonymes.
1 Phúsi,	1	Body of still.
2 Sachi,	2	Luting (of clay).
3 Putási,	3	Still-head.
4 Bhúta,	4	Furnace.
5 Batta,	5	Condenser, (copper.)
6 Dubli,	6	Receiver, (earthen.)
7 Putasi, (section of,)	7	Section of Still-head).

* Commonly called Ganda Biroza; it is well known to be the exudation from the denuded trunk of the different species of the pine throughout these mountains.

VII.—*Note on an Inscription found near the Kesariah Mound, in Tirhút.* By J. B. ELLIOTT, *Esq. (Pl. XVII. fig. 6.)*

[In a note to the Editor.]

Having seen mention of the Kesariah Mound made in the last No. of your Journal, I beg to enclose the impression of an inscription cut below the figures of the *Avatárs*, sculptured on a black stone, which I obtained at Kesariah several years ago from a fakír. The figures being small and rudely sculptured, it is not worth while making a copy of them; but as the inscription could not be made out by the Pandit of the Chaprâh Committee, it may be worth deciphering. I visited and made some notes on the subject of the pillars, and other antiquities in Champáran, which I may, perhaps, hereafter communicate.

Note.—This fragment, which is Brahmanical, not Buddhist, is in an ancient form of Dévanagarí, differing little from that noticed on the Bakra image of Mr. STEPHENSON. It breaks off abruptly with an initial *i*:—for it is only to *kírttir iha* that any meaning can be traced: while the diphthong *ai* or *é* is plain over the last letter, which I conclude to be an *h*. The reading in modern Dévanagarí will be as follows: I have added a literal Latin version.

नित्यः श्री चन्द्रदत्तः सूर्य्यदत्तस्य सूक्ताश्रयादित्याहसमुत्थः कीर्त्तिरिहे

Perpetuus B. ÇANDRADATTUS SU'RYADATTI "Sûkti"-(recitandi)-proprio-tempore-(sc.)-Solis-die-natus. Gloria hic.. .... ..

The interpretation of which in English will be:—

"The ever-living CHANDRADATTA was born on the Sunday appropriated to the reading of the Súkta by his father SU'RYADATTA. Glory here....." (The Súkta is the most sacred hymn of the Rig Veda, closing its 3rd Ashtaka or Ogdoad—and has for one of its verses the celebrated Gáyatrí.)

W. H. M.

[NOTE.—I take this opportunity of pointing out, in reference to my observation on the Bakrá image inscription, (page 131,) that I had overlooked a plate in FRANKLIN'S Palibothra, of a Buddhist image, with an inscription, to which Lieut. CUNNINGHAM has since drawn my attention. On turning to it, I perceive, that the two lines separately given are, though miserably perverted by the copyist, precisely the same as the *ye dharmmá hétun*, &c. of Sárnáth. The three lines on the pedestal, though stated in the text to be different, would appear to be the same also; at least the two first words, *ye dharmmá*, are distinct.—J. P.]

VIII.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 3rd June, 1835.

The Honorable Sir EDWARD RYAN, President, in the chair.

Read the proceedings of the last meeting.

Mr. JOHN RICHARDS, proposed by Mr. BAGSHAW, seconded by Mr. TREVELYAN, was duly elected a member.

Mr. J. P. GRANT was proposed by Mr. TREVELYAN, seconded by Mr. J. COLVIN. Mr. WM. ADAM, proposed by Capt. FORBES, seconded by Mr. HARE. Mr. WM. HY. BENSON, proposed by Dr. MILL, seconded by Mr. PRINSEP.

Captain TAYLOR, Madras Cav. proposed by Mr. MACNAGHTEN, seconded by Sir E. RYAN.

Dr. EVANS, Mr. PHAYRE, 7th Regt. Bengal N. I., Mr. STOCQUELER, and Lieut. MONTRIOU, Ind. N. were proposed by Dr. PEARSON, and seconded by Mr. J. PRINSEP.

The Secretary brought up the following:

Report of the Committee of Papers on Mr. J. T. PEARSON'S *proposition for creating a new order of Members, to be denominated "Associate Members of the Asiatic Society."*

1. "We consider Dr. PEARSON'S proposition for creating *Associate Members* to be worthy of adoption by the Society, and we would propose that they should enjoy all the privileges of ordinary members; but we would suggest, that by way of maintaining more than the mere distinction of name between the *Associate* and the *Honorary* Members, some contribution, however trifling, should be required from the former class. The *Associates*, it may be presumed, would be composed of men, whose reputation would not be sufficiently brilliant to admit of their being classed among our Honorary Members. They would, in all probability, did their circumstances admit, become ordinary paying members, and the principle upon which the present proposition rests, is, that the Society desirous of removing this obstruction, and encouraging their labours, is willing to admit them on a less expensive footing: at the same time, requiring a moderate contribution to distinguish them from those eminent men, whom it considers an honor to itself, to enrol in its list of members.

2. "Under the above considerations, we concur in recommending that the annual payment of Associate Members be fixed at four rupees. Their election to proceed in the mode prescribed for honorary members, that is, to be previously submitted to the Committee of Papers for report.

"For the Committee of Papers,

"*20th May*, 1835. "J. PRINSEP, *Secy.*"

The President, followed by Mr. J. R. COLVIN, proposed that "the first part of the Report be adopted, "That there should be Associate Members, having all the privileges of ordinary members."

Mr. D. Ross, seconded by Mr. MCFARLAN, moved as an amendment, that the words "with the exception of any power of voting on money questions" be added. This amendment was lost, as was another proposed by Mr. N. B. E. BAILLIE, seconded by Capt. FORBES, "that they should have all the privileges of ordinary members, except the right of voting."

The motion was then put and carried; the second proposal was also made into a resolution, viz. "That Associate Members shall pay an annual contribution of four rupees."

The Secretary submitted also the—

Report of the Committee of Papers, on Mr. GARDNER'S *application and estimate for Repairing the Monument of Sir* WILLIAM JONES.

"The Committee find on inquiry that the repairs may be executed at an expence of about 150 rupees.

"They trust the members will be unanimous in thinking it desirable, to evince the respect of the Society for the memory of its illustrious founder, by authoriz-

ing the trifling expence which will be required to repair his monument, and to preserve from obliteration that beautiful epitaph which he wrote for himself, and which is so characteristic of the independent uprightness and the unaffected piety of its author.

" For the Committee of Papers,
" *20th May*, 1835. " J. PRINSEP, *Secy.*"

Proposed by the Rev. Dr. MILL, Vice-President, seconded by Mr. COLVIN. and resolved, that the Report of the Committee be adopted and acted upon.

The draft of a Memorial to Government, regarding Oriental Publications, prepared by a Special Committee, appointed at the last meeting, was then read by the President, taking the sense of the meeting on each paragraph. The following is the Memorial, as finally adopted :

To the Hon'ble Sir C. T. METCALFE, *Bart. Gov. General of India in Council, &c. &c. &c.*

Honorable Sir and Sirs,

The Members of the Asiatic Society, now resident in Calcutta, have requested me, as President of their body, to address the Honorable the Governor General in Council, on a subject which engages their deepest interest.

2.—It has come to the knowledge of the Society that the funds which have been hitherto in part applied to the revival and improvement of the literature and the encouragement of the learned natives of India, are henceforth to be exclusively appropriated to purposes of English education.

3.—The Asiatic Society does not presume for a moment to doubt the power of the Government to apply its funds in such manner as it may deem to be most consistent with the intentions of the legislature, and most advantageous for the great object of educating its Indian subjects ; but they contemplate with the most sincere alarm the effect that such a measure might produce on the literature and languages of the country, which it had been hitherto an object both with the Government and with the Education Committee, under its orders, to encourage and patronize, unless the proposition which they have the honor to submit, meet with the favorable attention of Government.

4.—The Society has been informed, that this departure from the course hitherto pursued has been ordered to take such immediate effect, that the printing of several valuable oriental works has been suddenly suspended, while they were in different stages of progress through the press ; and that the suspension has been alike extended to the legendary lore of the East, and to the enlightened science of the West, if clothed in an Asiatic language.

5.—The cause of this entire change of system has been, the Society understand, a desire to extend the benefits of English instruction more widely among the natives of India ; the fund hitherto appropriated to that purpose not being deemed sufficient.

6.—The Members of the Society are individually and collectively warm advocates for the diffusion, as far as possible, of English arts, sciences, and literature ; but they cannot see the necessity, in the pursuit of this favorite object, of abandoning the cultivation of the ancient and beautiful languages of the East.

7.—The peculiar objects of the Asiatic Society, and the success with which its members have, under the auspices of their illustrious founder, prosecuted their researches into the hidden stores of oriental knowledge, entitle them to form an opinion of the value of these ancient tongues, intimately connected as they are with the history, the habits, the languages, and the institutions of the people ; and it is this which emboldens them

to step forward on such an occasion as the present to offer an humble but earnest prayer, that the encouragement and support of the British Government may not be withdrawn from the languages and literature of the vast and varied population, whom Providence has committed to its protection.

8.—Many arguments of policy and humanity might be advanced in support of their present solicitation, upon which the Society do not deem it within their province to expatiate. There is one argument, however, which appears to be of so conclusive a character as to require distinct notice in this Appeal.

9.—It is admitted by all, even the most enthusiastic advocates of the English system of tuition, that this language never can become the language of the great body of the people whose moral and intellectual improvement is the benevolent object of the British Government. It is moreover admitted, that the Sanscrit language, while it is directly the parent of the dialects spoken from Cashmere to the Kistna, and from the Indus to the Brahmaputra, is also the source from which every other dialect of the Peninsula, and even many languages of the neighbouring countries, have been for ages dependent for every term extending beyond the merest purposes of animal or savage life. If it were possible to dry up this source of literary vegetation, which gives beauty and fertility to the dialects of India in proportion to the copiousness of its admixture; the vernacular languages would become so barren and impoverished, as to be wholly unfit to be the channels of elegant literature or useful knowledge. The same may be said of Arabic and Persian as regards the Hindustáni language.

10.—The Society are far from meaning to assert that the withdrawal of the support of Government, from the cherished languages of the natives of India, would put an end to the cultivation of them. On the contrary, they think that the natural and necessary effect would be that both the Hindus and Muhammedans would, in that event, adhere with tenfold tenacity to those depositaries of all they hold sacred and valuable. But, incalculable mischief, in a variety of shapes, would nevertheless be effected. If the British Government set the example of neglecting oriental studies, it can hardly be expected that many of their European subjects will cultivate them. The field will then be left in the undisturbed possession of those whose unprofitable husbandry is already but too visible, and who will pursue it with a view to the perpetuation of superstition and defective morality among the people. An influence will thus be lost, the benefit of which to the more intellectual classes of natives can scarcely be estimated too highly, arising from the direction given to their studies and pursuits by those who can freely acknowledge what is intellectually and morally valuable in their previous systems, and distinguish it from what is of an opposite character: and who take the first and most necessary step for removing the wrong prejudices of others, by proving that they are without unjust prejudice themselves. It needs no laboured proof to shew how infinitely more powerful must be our protest against what is demoralizing or debasing in the native institutions, when we act with this knowledge and this spirit, than if we commenced by repudiating every thing Asiatic, as contemptible, and acknowledged no basis of intellectual communication with them, but what was formed in the peculiar fashions of modern Europe.

11.—If the Sanscrit and Arabic languages, consecrated as they are by ages of the remotest antiquity—enshrined, as they are, in the affections of venerating millions—the theme, as they are, of the wonder and of the admiration of all the learned nations of Europe;—if these languages are to receive no support from a Government which has been ever famed for its liberality and its justice,—from a Government which draws an annual revenue of twenty millions from the people by whom these languages are held sacred, it is the decided opinion of the Asiatic Society—an opinion which they want words

to express with adequate force, that the cause of civilization and the character of the British nation will alike sustain irreparable injury.

12.—The Society, therefore, earnestly beseech the Honorable the Governor General in Council, that if, on full consideration, any reasonable doubt shall be entertained by the Supreme Government of the right of the native literature to a fair proportion of the sum appropriated by Parliament, "for the revival and improvement of literature, and for the encouragement of learned natives of India," he will then be pleased either himself to grant, or if necessary, to solicit from the Court of Directors, some specific pecuniary aid to be annually expended on these objects. And the Society will be happy to undertake the duty of superintending the expenditure of this sum, under such checks as it may please the Government to impose.

13.—But whatever may be the determination of the Government on this point, the Society respectfully intreat the Governor General in Council, that he will be pleased to afford to them the assistance of the learned natives hitherto employed in these literary undertakings, together with such pecuniary aid as may be necessary, to complete the printing of the oriental works, which has been interrupted by the resolution of Government to direct the funds hitherto expended upon them to purposes of English education.

14.—Should Government be pleased to accede to this request, the Society will furnish with as little delay as possible an estimate of the amount which will be required for the attainment of this object.

15.—The Society cannot doubt that the Governor General in Council will support their appeal to the home authorities with his powerful advocacy, nor that the earliest opportunity will be taken of bringing the merits of the important and entirely national question it embraces, before the Honorable the Court of Directors, in all its bearings. This address has been dictated solely by the desire of proffering to Government the services of an appropriate organ, through which the publication of the oriental classics may be continued, and that further patronage extended to oriental studies, which it cannot believe the Government to have any intention of altogether abandoning.

EDWARD RYAN, *President.*

Asiatic Society's Apartments,
June 3rd, 1835.

Upon the first five paragraphs one or two verbal alterations only were suggested. On the 6th, which originally ended, "but they would deeply regret if, in the pursuit of this favorite object, it were thought necessary or advisable to abandon, &c."

Mr. COLVIN begged to propose the omission of the word "favorite," as applied in the above paragraph of the Address to the object of extending the means of English education. It appeared to him to convey an unnecessary imputation, as if of prejudiced favoritism or partiality. He would here say (alluding to some remarks which had passed in conversation), that he entertained as cordial a desire, as any one could do, to promote the literary purposes, with a view to which the Society was formed. He, as a member of the Society, fully sympathized in the feeling which would seek to maintain the knowledge and cultivation of the oriental languages and literature, and he would readily join in an address to Government to obtain its patronage and pecuniary support for those studies; but he had hoped that the proceedings of the evening were to be free from controversy. He had not been present at the meeting of the previous month, but he had seen with great gratification, that the proposition then adopted was for the preparation of a memorial, "which should avoid to the utmost all controversial points." He feared from the observations which had been made that he should be disappointed in this respect. He had, however, been unintentionally led, by what had passed, into a digression; returning to the object for which he had risen to speak, he proposed the omission of the word "favorite" in the passage which had just been read.

Mr. W. H. MACNAGHTEN could not help expressing his astonishment, at the observations which had been made by the gentleman who had just sat down. He had hoped that in this place at least, oriental literature would have found protection and favor: that, however ruthlessly and successfully the opposition to this cause might have manifested itself in other quarters; here, at least, no enemy would be permitted to enter under the garb of a votary, and that this sanctuary of science might not be polluted by any unhallowed voice. Now he was tempted to exclaim, *Procul, O procul este profani!* When he heard a gentleman coming forward with such an objection as has been made, he could not help ascribing it to something more than a dislike to the epithet. What expression could possibly have been used more innocent or more appropriate? Here was the fact before them, that the funds dedicated to oriental literature had been entirely carried off; that works of all descriptions, scientific as well as others, had been strangled in the very act of coming into the world, and thrown aside as useless and pernicious; and after all this, when they said that the authors of this to them grievous calamity were actuated by another *favorite* object, they were taken to task for the expression. He really wanted words to express his surprise at such a frivolous objection being urged, and he trusted the Society would evince the same sense of it as he entertained, that it was wholly unworthy of being attended to.

Mr. COLVIN'S proposition was not seconded.

Mr. PRINSEP, thought that the terms 'deeply regret' were not nearly strong enough to show the sentiments of the Society—he would suggest '*cannot see the necessity*' as more appropriate.

This expression after some discussion was substituted.

On the perusal of the 12th paragraph, which stood originally as follows:

"The Society therefore earnestly beseech the Honorable the Governor General in Council, that *he will be pleased to solicit pecuniary aid from the Court of Directors, to be annually appropriated to the revival of the oriental literature, and the encouragement of learned natives*, and the Society will be happy to undertake the superintendence, &c."

Mr. H. T. PRINSEP moved as an amendment, that the sentence be altered, (as it now stands in the memorial,) to convey a stronger expression of the Society's feeling on the recent measure.

Mr. COLVIN said, that he must oppose the amendment. He took the liberty of again addressing the meeting, as he was desirous to record his opinion on the question which had now been brought under discussion. He would not enter into an argument on the point of law which had been mooted. He had himself always considered, and still considered, the orders of the Government to be fully consistent both with the terms and the spirit of the act of Parliament. He must think it difficult to believe, that the legislature, in the first, and only specific appropriation which it had made with a view to the mental advancement of the Indian people, had intended not to entrust to the Government, to which it has committed the immediate control of these territories, the discretion of applying the fund as it might judge most expedient and practicable, in order to the cultivation of the most improved literature, and the communication of the most enlightened systems of knowledge, which its subjects might be found willing to receive at its hands. It appeared to him a strange conclusion, that it had been meant by the British Parliament to render compulsory the maintenance of a system calculated to perpetuate the ignorance and prejudices of the people—that it had been designed to fetter this Government and to restrain it from measures of improvement. But he had said, that he would not go into a discussion of the point of law. He would rather state what he considered to be the duty of the Society in regard to the address which was now to be presented. Was it proper, he would ask,—was it respectful, in going up to Government as applicants for its assistance, that they should assert, by implication, that it had, in its late measure, deviated from its proper course? Was that a subject which the Society ought to entertain at all? Further, he would urge that it would certainly be most disadvantageous for their own purpose, were they, in appealing to the liberality of

Government, to express in any manner disapprobation of its proceedings. Looking only to the motive of securing the success of the application which they were about to make, he would say, omit in the address all and every topic of controversy. The Government, in receiving an address such as was now proposed, would appear called upon to vote its own condemnation. He would, on these grounds, give his voice against the amendment.

Mr. MACNAGHTEN again rose, and spoke to the following effect:

Mr. PRESIDENT, we have been assured by Mr. COLVIN more than once, that he is no lawyer. He could not have asserted with equal truth, that he is no preacher, for he has favoured us with a very lengthy discourse on our duties, both to the Government and the people. But I must take the liberty of differing with him altogether, as to the doctrines he has propounded. We are an independent, and I trust, a respectable body, congregated for the purpose of promoting by every means in our power the cause of literature and science. As the guardians of that sacred cause, it is not only our privilege, but our duty to appeal, respectfully it is true, but earnestly, to that power which is competent to rescue it from impending danger. I would go further and say, that if the Government could be so infatuated as to declare open hostility against the languages and literature of the people of India, it would be an obligation, of which we could not divest ourselves without disgrace, to remonstrate against such a proceeding with all our energies. If we think we have the law as well as the justice of the case on our side, no liberal, no equitable Government would be offended by our pointing it out.—Mr. COLVIN has again returned to the ground which he first took up, and has indulged in the use of slighting and contemptuous language as applied to oriental studies. He has moreover asserted, that such sentiments are entertained by the natives themselves. Gentlemen, I have now been resident in this country upwards of twenty-six years, and, I believe, I may say, that I have not been deficient in my attention to the genius of the people, their languages, their literature, their habits, or their prejudices, and I will venture to affirm, that nothing can be more without foundation than the supposition which Mr. COLVIN appears to entertain. Oriental literature has much to recommend it, and the natives of the country are passionately devoted to that literature. It cannot be otherwise. I cannot sit down without again expressing my astonishment, that this place should have been selected for such an attack. If havoc and desolation rage around us, we may not be able to prevent it; but here in the citadel of our strength, that an effort at our overthrow should be made, is to me astonishing. I have no fear, however, that it will be successful, or that there will be difference of opinion as to the character of the proceeding.

The PRESIDENT, however unwilling to offer an opinion from the chair, must object to the amendment, because it appeared to entertain a doubt of the legality of the course pursued. Government acted by advice, and there remained an appeal to the proper tribunals if any interest were aggrieved. He was anxious to impress on the Society the necessity of abstaining from legal and political discussions, as quite out of character in a literary and scientific institution. Otherwise they must lose many members who could not vote, nay, could not sit, where such topics were to be canvassed. The case was strong enough of itself; the application for continuing the suspended oriental publications was a most proper object for the Society to urge; it should have his warmest support, provided it were unmixed with other matters which had been the subject of discussion elsewhere, and upon which the Government had expressed their opinion. He had a very strong opinion on the necessity of excluding debatable topics of this nature from the Society, and if they were to continue such discussions he for one should be compelled to retire. Literary and Scientific subjects seemed to him the only matters proper for discussion with them, except the little usual business which must of course be disposed of.

Mr. MACNAGHTEN, with the most unfeigned deference and respect to the learned President, must take leave to express his doubts, as to the doctrine which he had delivered, or at all events to seek for some explanation which might solve his difficulties. He understood from him, that in this place, they were never competent to touch upon a question of law, and that if they did, those who are connected with

the legal profession must cease to be members of the Society. This doctrine seemed to him to involve the necessity of submitting to every species of spoliation. Moreover that they were not competent to advert in any way to the measures of Government. Now it appeared to him, that they were not here as lawyers or as civil or military servants of the Company; and that when they met in this hall, they divested themselves of those characters, and appeared only in the character of the servants of science and of literature, the guardians of oriental learning, and the representatives of its interests both in Asia and in Europe. In that sacred character they were bound to be vigilant and active. Indeed, he could conceive cases involving questions of law, in which they should feel themselves compelled to act. Supposing the Government were to be advised that they held a mortgage in the Society's premises, and that upon this hint, they were to proceed *instanter* to an ejectment. Ought they in such a case tamely to resign their right, because there happened to be lawyers among them? He could understand the motive which should restrain particular gentlemen from expressing an opinion, but he could not conceive any circumstance which would justify their surrendering without a struggle the rights of their constituents. Those constituents are, he said, the literary men of all nations. They had an awful trust imposed upon them, and they must execute it faithfully and conscientiously as a great public body, without any personal motives, or any personal scruples.

Mr. PRINSEP felt great diffidence in expressing his dissent from what had fallen from the President, the more so, as he was himself a most unworthy member, whereas the President's merits towards the Society were of the highest character. But he could not think, under British Government, any society, or even any individual could have the least hesitation in expressing respectfully an opinion, that the Government had misconstrued a law, when that misconstruction was likely to do injury to the rights or the feelings of so large a portion of its subjects as the native community formed in this country. No wilful error or wrong was imputed to the Government: but surely it was not too much to say, as he was confident was the case, that Government had in this instance been ill-advised and misled. He did not speak as a lawyer, but as a member of this Society, whose position in respect to the literature of India had been well described by Mr. MACNAGHTEN. That there could be no possible offence to Government in so expressing themselves he felt assured, by seeing members and high officers of the Government ready to join in so doing. He was somewhat surprised at what had fallen from Mr. COLVIN, as to the ancient literature of India, being calculated only to perpetuate idolatry and superstition. What would be thought, if England had possessed herself of Greece, a part of which was under her dominion, and had bestowed funds for reviving its language and literature,—would any one be listened to who should urge, that with the language of Greece one would be reviving her mythology? The most advantageous thing for the advancement of European literature in India was to revive that of the country, and place them in contrast side by side: it was easy to see which must then prevail. He did not think the Society should take so humble a tone as to ask, as a charity, that which Parliament had given as a right, and would rather not succeed in the object that all had equally at heart, than take it in the shape of an eleemosynary donation.

Mr. H. T. PRINSEP quoted the words of the act, which he believed had been grounded on a minute of Mr. H. COLEBROOKE'S, specially pointed to the literature and learned natives of the country. He thought there could be no doubt as to the meaning of the clause, and if such were entertained by any present, he should not hesitate to take the votes of members as to the construction to be put upon the words. Entertaining this opinion, he thought the Society ought to have no hesitation about expressing it; and as for the fact stated, that the Government had put a different interpretation upon the law, he knew not how the Society could know that these questions had ever been determined by the Government. But even if this point had been so ruled, that was no reason why the members of this Society, if their opinion was clear as to the legal rights of this literature, of which they were the patrons and protectors, should not express that opinion even to the Government. He was quite sure it was the general feeling, that the grant was made by Parliament to the literature of India, which ought not to be robbed of

the provision so made to it. By the amendment, it was intended to express this as delicately and respectfully as possible.

Sir J. P. GRANT thought it right to state, that in voting for the amendment, he did not mean to give an opinion upon the question of law. He did not think that the amendment went to express any opinion upon the question of law, and if it did, most certainly he neither would nor ought to vote upon it. It merely, in his opinion, asked of the Government to give its consideration to the question, and in case they should be of opinion that oriental literature had not a legal and parliamentary claim under the words of the act, then to make a new and specific grant of funds for this important purpose.

Mr. W. GRANT was not disposed to blink the question which the Society wished to bring under the reconsideration of Government, and did not see that any disrespect was implied in urging, however strongly, such reconsideration. The Society had for a long time believed, that a particular fund was appropriated by Parliament to objects in a manner confided by the public to the Society's peculiar care, and they now learned that this fund was no longer to be so applied. The Society was bound to undertake the cause of oriental literature, and to urge Government to reconsider a resolution so inimical to it. And if upon serious reconsideration, Government should continue to be of opinion, that no fund was by law appropriated at present to its conservation, then to urge an application to the proper quarters for a fund which should be so appropriated.

Mr. COLVIN asked Sir J. P. GRANT, whether the words of the amendment which he read did not at least by implication convey an opinion upon the question of law.

Sir J. P. GRANT said, that in his opinion they did not, but that the words in the Act of Parliament being such as they had that night been stated to be, the amendment suggested to the Government, that it was a grave question, of which it desired their reconsideration, and upon this view he was prepared to vote for the amendment; but the suggestion being made that it might be otherwise interpreted, he should not vote.

The amendment was then put and carried. The revised memorial was once more read through, and, on the motion of Mr. H. T. PRINSEP, seconded by Bábu RASUMAY DUTT, it was adopted nem. con.

Read a letter from Captain WADE, enclosing one from the Chevalier VENTURA, acknowledging his election as an honorary member.

Read extract of a letter from Lieut. A. BURNES, enclosing copies of desiderata in Botany from Professor GRAHAM, and in Geology from the London Society.

Read a letter from THOMAS DICKENSON, Esq. Secretary to the Bombay branch of the Royal Asiatic Society, acknowledging the receipt of M. CSOMA's Tibetan Dictionary and Grammar, and expressing the best thanks of that Society for the same.

Library.

Read a letter from EDWARD T. BENNETT, Esq. Secretary to the Zoological Society of London, forwarding its proceedings for the years 1830, 31, 32, and 33, with the 2nd part of the 1st volume of their Transactions, for presentation to the Society.

Read a letter received through M. L. A. RICHY, from Monsieur GARCIN DE TASSY, forwarding for presentation copy of a work entitled "Les Œuvres De Walí, *(Dewán-Walí,)* recently published by himself in Hindustani at the royal press of Paris.

The Indian Journal of Medical Science, No. 18, was presented by the Editors.

Meteorological Register for April, 1835, by the Surveyor General.

The following books were received from the book-sellers.

Lardner's Cabinet Cyclopedia—Simson's Roman Empire, vol. 2nd.

————————————, Germanic Empire, vol. 1st.

Library of Useful Knowledge—Natural Philosophy, vol. 3rd.

A List of the Pali, Burmese, and Singalese works, in the Burmese character, (some with Burmese interpretations) in the Asiatic Society's library, was submitted, and ordered to be printed in the out-coming catalogue.

Museum and Antiquities.

A model of the Táj Mahal at Agra, in ivory, was presented on the part of Messrs. W. CARR and J. PRINSEP.

A note from the Baron Von HUGEL, on the variance of the Tope at Sárnáth, from the Dehgopas of Ceylon, was read.

[This will find a place in a future number.]

A letter from Col. S. P. STACY announced, that he had despatched for the inspection of the Society, to the charge of their Secretary, his very extensive collection of Bactrian, Indo-Scythic, ancient Hindu, and Muhammedan coins, of which he also forwarded a detailed catalogue.

This collection is more than usually valuable from its having been made principally in central India, and it is mainly rich in Hindu coins, of which it will serve to devolope many series with names hitherto unknown.

Physical.

Specimens of Copper Ore from the Ajmír mines, with a descriptive account by Captain DIXON, addressed to the Governor General, were presented through Captain SMYTH, Mil. Sec. G. G.

An account of the bearded vulture of Nipal, *Gypaëtos barbatus*, by Mr. B. H. HODGSON, was submitted, with an accurate painting by his native artist.

Mr. HODGSON is in possession of upwards of 2000 illustrations of the Fauna, and the Ornithology of the valley, which he is now seeking to publish in a worthy manner, in conjunction with eminent naturalists at home. The plates and descriptions of the Mammalia are already gone to England, and the others will soon follow. The whole will form a memorable monument of his zeal and indefatigable industry.

Extracts of a letter from Professor WILSON were read.

The Ashmolean Society, is anxious to obtain through the Asiatic Society, an entire skeleton of an alligator, for the purpose of perpetual comparison with the fossils of the Saurian tribe at home. An inquiry has arisen which can be solved only in this country, Do Elephants shed their tusks? The immense supply of them brought from Africa to England, if derived from the death or destruction of the animal, must it is thought soon lead to its extermination.

[Mr. WILSON, has, we are happy to remark, prepared the *Vishnu Purána*, the *Sankhya Chandrika*, for the press, and only waits the casting of a new fount of type. The Hindu theatre has passed through a new edition. MOORCROFT's Journals are still in MURRAY's hands, and the bust not commenced upon, by CHANTREY.]

Notice on the fœtus of the basking shark *(squalus maximus)*, and a preserved specimen, were submitted by Dr. J. T. PEARSON

A paper was submitted by Mr. F. G. TAYLOR, H. C. Astronomer at Madras, on a new method of ascertaining the error of collimation in astronomical instruments by reflection from a surface of the mercury.

[This very valuable and simple method is described in the present number.]

A note on the mummy brought by Captain ARCHBOLD from Egypt was submitted by Dr. EVANS.

From the lateness of the hour the reading of the papers presented was postponed to the next meeting.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of May, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer at 32°.	Wet Barometer, do.	Aqs. Ten. deduced.	Ther. in air.	Diff. or M. T. Depress.	Leslie's dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Aqs. Ten. deduced.	Thermometer in air.	Different.	Leslie's dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	Evening.	Morning.	10 A. M.	Evening.
1	29,806	28,506	1,300	86,3	8,4	8,1	89	,670	,234	,436	89,8	13,8	13,5	75,0	..	..		S.	w.	w.	clear.	fair.	cumuli.
2	,780	,458	1,322	87,1	7,3	7,0	91	,664	,198	,466	91,5	11,6	11,3	82,0	..	..		se.	sw.	sw.	do	fine.	fine.
3	,768			87,0				,635							..	..		ne.			misty.	do	do
4	,742	,377	1,365	88,4	8,0	8,0	89	,636	,156	,480	91,4	11,1	11,2	83,	..	..		S.	sw.	sw.	light clds.	cumuli.	do
5	,797	,470	1,327	87,9	8,7	8,0	90	,675	,200	,475	91,0	14,1	14,5	76,	..	..		o.	nw.	w.	clear.	fine.	hazy sky.
6	,782	,456	1,326	87,5	11,3	10,8	84	,671	,287	,384	90,8	13,4	13,2	80,	..	..		n.	sw.	se.	cloudy.	hazy.	fine.
7	,770	,396	1,374	88,9	9,1	8,4	89	,671	,398	,273	86,5	7,4	9,3	90,	..	..		se.	s.	se.	clds.and mist	do	dull.
8	,794	,471	1,323	87,5	7,1	6,7	93	,680	,356	,324	87,9	7,8	8,6	99,	74,8	115,8	0,75	E.	se.	s.	cir. cumuli.	threatening.	over cast.
9	,784	,490	1,294	87,3	7,2	6,8	92	,679	,322	,347	88,3	8,6	9,5	88,	73,5	105,0		E.	se.	sw.	do	hazy.	cumuli.
10	,776			78,9				,678	,436	,242	83,4	3,3	4,1	99,	73,0	76,5	1,75	SE.	SE.	e.	very hd. rn.	all day	and night.
11	,718	,576	1,142	83,3	4,7	2,7	99	,669			72,0				73,0	81,5	12,00	S.	S.	s.	sd.th.lgt. rn.	storm.	cloudy.
12	,662	,558	1,104	01,7	3,6	3,2	99	,623	,369	,163	83,5	4,6	4,5	98,	72,0	98,2		o.	se.	nw.	overcast.	hazy.	gathering.
13	,592	,480	1,112	82,0	3,0	3,3	99	,498	,322	,176	84,1	5,6	5,4	96,	74,0	106,8		nw.	nw.	nw.	rain.	do	hazy c. c.
14	,622	,424	1,198	84,3	5,6	5,3	95	,543	,348	,195	85,3	5,7	5,8	95,	74,7	126,2		n.	sw.	se.	hazy.	gathg. clds.	cir. cumuli.
15	,680	,480	1,200	85,1	4,5	4,4	93	,546	,141	,405	89,4	9,1	9,1	89,	76,4	110,1		s.	sw.	se.	fog.	blowing stg.	cumuli.
16	,594	,284	1,310	87,1	5,2	5,4	96	,486	,147	,339	88,6	5,6	5,7	96,	79,5	102,5		S.	sw.	se.	scud cumuli.	cumuli.	do
17	,530			85,8				,433			86,0				81,5	109,5		S.	S.	S.	do	cirri.	fair.
18	,497	,135	1,362	88,5	5,1	5,3	97	,406	,886	,520	92,3	7,7	7,5	97,	80,3	117,0		S.	S.	se.	hazy.	fine.	do
19	,536	,140	1,396	89,5	5,6	5,9	95	,491	,990	,501	92,0	7,9	7,3	92,	81,0	101,6	1,15	SE.	S.	s.	cloudy.	hazy.	cum. hazy.
20	,734	,418	1,316	87,7	5,4	5,7	95	,554	,181	,373	90,3	7,2	7,0	93,	71,1	108,6		o.	ne.	se.	do	cloudy.	gathering.
21	,712	,370	1,342	88,0	8,4	8,4	88	,586	,162	,424	90,3	9,2	8,6	88,	74,5	115,6		ne.	S.	sw.	clear.	fine.	fine.
22	,694	,346	1,348	88,3	5,7	5,8	95	,580	,126	,454	91,0	9,4	9,1	88,	79,1	113,0		S.	se.	sw.	do	cir. cumuli.	do
23	,734	,406	1,328	87,9	7,0	7,2	93	,635	,196	,438	80,8	10,3	10,5	84,	79,0	110,1		S.	sw.	sw.	cum. cirri.	hazy.	do
24	,750			87,0				,610			87,2				80,3	109,8		SE.		S.	overcast.	cloudy.	cloudy.
25	,608	,293	1,315	88,9	6,7	6,9	93	,486	,118	,368	91,7	8,1	7,9	91,	79,8	103,6		S.	S.	S.	cumuli.	cumuli.	do
26	,562	,246	1,316	88,9	6,3	6,6	94	,528	,096	,432	90,8	7,4	7,7	91,	72,2	111,6	0,05	S.	S.	se.	do	hazy.	do
27	,687	,424	1,263	87,0	6,0	6,5	92	,576	,218	,358	89,2	7,8	7,1	89,	77,2	114,8		E.	ne.	se.	overcast.	do	misty sky.
28	,649	,299	1,350	86,3	5,7	5,7	95	,619	,114	,405	90,2	8,3	8,2	88,	77,0	122,5		E.	ne.	n.	cumuli.	do	cir. cumuli.
29	,609	,294		88,2	7,3	7,4	90	,456	,120	,336	89,9	5,7	7,0	91,	76,8	133,0	0,10	ne.	ne.	se.	fine.	cumuli do.	stratus rain.
30	,583	,296	1,287	87,6	7,0	4,2	93	,496	,230	,266	87,1	4,1	6,3	95,	76,8	98,5		ne.	ne.	ne.	do	stratus nim.	cir. stratus.
31	,585			82,7				,520							77,0	118,9	0,05	n.	N.	o.	slight rain.	showery.	showery.
Mean,	29,683	28,388	1,293	86,8	6,5	6,3	93	,577	,206	1,368	86,3	7,5	7,6	90	76,4	108,7	15,85	southerly.			rain early, and very heavy.		

The Barometer registered on Sundays is a different instrument, but it agrees with the other within ·01 inch, the thermometer accompanying it shews a much lower temperature in the dwelling house than at the Mint, where the heat given is that of an open laboratory.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 42.—*June,* 1835.

I.—*On the Government and History of Naning in the Malay Peninsula.* By *Lieut.* J. T. NEWBOLD, 23*rd Regt. Madras Nat. Inf.*

Native Government of Naning.—The Government of Naning, set ting aside its connexion with the European powers at Malacca, which interfered very little in its internal organization, was at once feudal and pastoral in its character. The classification of the people into tribes was nearly as well defined as that of the children of Israel, described by Moses in the Pentateuch.

Panghúlús.—The office of *Panghúlú* has been hereditary, subject to the approbation of the Government at Malacca, agreeably, generally, to the Menángkábowe law of succession of the *Anak Perpáti Sabátang,* or the *Tromba Pusáka Menángkábowe.* The right of succession devolving upon the eldest male child of the sister; who however may be set aside in case of imbecility or other causes. This singular law of succession prevails throughout Naning.

The last *Panghúlús* of Naning were of the tribe *Se Melongan.* They were generally brought down by the four heads of tribes, or *Ampat Súkú,* to Malacca, to be confirmed by the European Government.

JUÁRA' MAGAB, the first *Panghúlú* of the last line, arrogated to himself the power of inflicting capital punishment on the inhabitants confided to his charge. It was exercised and abused by his successors until 1809, when it was rescinded by the British Resident, Colonel FARQUHAR; a gentleman whose name is held in affectionate remembrance by most of the Malays, both of Malacca and the neighbouring independent states.

The last death sentence passed by ABDUL SAYAD (or DHOL SAYAD), the ex-*Panghúlú,* was on a Queda man, named SALI, in 1805. This Malay had carried off from Malacca two Chinese slaves, a man and

woman; meeting some resistance from the former, he had murdered him, with his *kris*, in the forest of Londoo, and proceeded with the woman to Píla, in Srímináti, where he sold her.

The present superintendent of Naning, Mr. WESTERHOUT, who was an eye-witness, described to me the ceremony of his trial and execution. The criminal was conducted bound to *Buket Peniálang*, or "execution hill," near Tabú. The *Panghúlú*, the *Ampat Súkú*, the 12 *Panglímás*, the *Bandhára*, and the *Makdám* were all seated in judgment under a cluster of Tambuseh trees, on the skirt of the hill. The witnesses were brought forward and examined by the *Panghúlú* himself. The evidence against the prisoner being deemed conclusive, according to the forms of the Muhammedan law, he was sentenced, agreeably to the *Adat Menángkábowe*, to pay one *Bhár* (equivalent to 24 Spanish dollars, and 30 cents), or to suffer *(Salang)* death by the *kris*. Being unable to pay the fine, preparations were made for his immediate execution. The grave was dug on the spot, and he was placed firmly bound in a sitting posture, literally on its brink. For further security, two *Panglímás* sat on each side, whilst the *Panglíma Besár* SUMUN unsheathed the weapon that was to terminate the trembling wretch's existence. On the point of the poniard, the *kris panjang*, the *Panglímá* carefully placed a pledget of soft cotton, which he pressed against the man's breast, a little above the right collar bone. He then slowly passed the weapon's point through the cotton, on which he kept the fingers of his left hand, firmly pressed in a direction obliquely to the left, into his body, until the projection of the hilt stopped its farther progress. The weapon was then slowly withdrawn, the *Panglímá* still retaining the cotton in its place by the pressure of his fingers, by which the effusion of blood externally was effectually stanched.

The criminal, convulsively shuddering, was instantly preciptated into the grave; but on his making signs for water, was raised. He had barely time to apply his lips to the cocoanut shell, in which it was brought, when he fell back into the grave quite dead. The earth was then hastily thrown over the body, and the assembly dispersed.

The Ampat Súkú.—Next to the *Panghúlú*, were the four heads or representatives of the four *Súkús*, or tribes, into which the population of Naning was divided.

In the ex-*Panghúlú's* time, the head of the

Súkú Sa Melongan, was Mahárájá NUNKAIO.
„ *Anak Malacca*, „ ANDIKA' Mahárájá.
„ *Tigá Battá*, „ DATTU AMBANGAN.
„ *Munkáh*, „ ORANG KAIO KI'HIL.

There are three other Súkús or tribes in Naning, viz. those of *Battá Balong, Tigá Neyney,* and *Bodoandá.* The number of individuals composing these tribes being so insignificant, they were included in the four general divisions.

The office of the head of the *Súkú* was not exactly hereditary. In the event of a casualty, the place was generally filled up by the remaining three from the most eligible of the deceased's family. Their office was to assist the *Panghúlú* with their counsel and advice; if unanimous, they could carry their point against him.

They were always consulted in any matter of importance, and affixed their seals to all deeds and agreements. Letters to the Government at Malacca, and to the heads of independent states were invariably written in the name of the *Panghúlú* and *Ampat Súkú.* Each was individually responsible for his tribe to the *Panghúlú,* in matters of revenue, levying men and settling disputes.

Their revenue was derived principally from the power they enjoyed of levying fines on their own particular tribe, and from a portion allotted to them by the *Panghúlú* from his annual levy on each house of five gantams of paddy.

Mantrís.—The *Mantrís* were a species of privy councillors to the *Panghúlús,* two in number. The last were MELA'NA' HAKÍM and GOMPA'R. They fled with the *Panghúlú* to Míko in Rumbowe, but have since returned.

Panglímás or *Hulubalangs.*—The *Panglímás* are the war chiefs. The ex-*Panghúlú* had 12; viz. *Panglímas Besár, Jati, Arrip, Beibas, Sultán, Tambi, Prang, Troh,* 2 *Bangsahs, Kiodin,* and *Rajá Balang.* Four of these were personally attached to the *Panghúlú;* viz. *Panglímás Besár, Prang, Jati,* and *Arrip:* the rest to the *Ampat Súkú.*

Besides the levying of men in war, and leading them to combat, building stockades, &c. the duty of a *Panglimá* is in peace, the apprehension of criminals, bearing official messages and letters, and making requisitions.

On these occasions, the *Panghúlú's* spear *Tombok Bandaran* was sent with them, in token of their authority.

This custom prevails generally among Malayan chiefs.

The above form of government was entirely abolished on the settling of the country after the disturbances in 1832, as will appear hereafter.

History.—Naning was taken possession of, together with the Malacca lands, by the Portuguese, shortly after the capture of Malacca by ALPHONSO ALBUQUERQUE, in 1511. Previous to this, it had formed an

integral part of the dominions of MUHAMMED SHÁH II., Sultán of Malacca; who, on the fall of his capital, fled to Muar, thence to Pahang, and finally to Johore, where he established a kingdom. Naning remained nominally under the Portuguese, till 1641-2, when with Malacca it fell into the hands of the Dutch, and their allies the sovereigns of Johore and Achin. According to a Malay manuscript in my possession, "the Hollanders made many bonds with the king of Johore, on golden paper, including numerous divisions of shares and territory," among which are specified the interior boundaries of Malacca, viz." From the mouth of the Cassang to its source southerly; from the mouth of the Lingí river to Ramoan China northerly to Buket Bruang, Bakowe Rendah, Ramonia Chondong, Padang Chachar, Dason Mariah, Dason Kappar Ulú Malacca to the source of the Cassang river. Done, written, and sealed by the Hollanders and king of Johore, on paper of gold."

VALENTYN, however, asserts, that the 1st article of the treaty between the Dutch and the king of Johore was, that the town be given up to the Dutch, and the land to the king of Johore, reserving, however, to the Dutch so much territory about the town as is required, and license to cut fire-wood. Be this as it may, Dutch policy soon extended the meaning of this into the possession of an area of nearly 50 miles by 30, which comprised the whole of Naning up to the frontiers of Rumbowe and Johore.

This line of latter days has been extended beyond Buket Bruang and Ramoan China, to the left bank of the Lingí river, which it now comprehends.

History of Naning.—The Dutch, on their taking possession of Malacca in 1641, found Naning under the government of the *Ampat Súkú*, or heads of the four tribes, into which the inhabitants are divided. In the Dutch Governor General ANTHONIJ VAN DIEMEN'S administration, an agreement was made by the first Land-voogd, or Governor of Malacca, JOHAN VAN TWIST, on the 15th of August, 1641, with the chiefs of Naning and the neighbouring villages: by which the latter promised fidelity to the States General and the Company, and abjured their former engagements with the Spaniards and Portuguese. The property of all persons dying without issue to be divided between the Company and the native chiefs; that of persons guilty of murder, to be appropriated half for the use of the Company, and the remainder for their heirs. The company to be entitled to one-tenth of the produce, and to a duty of 10 per cent. on the sale of estates. Such taxes to be collected by native servants, who will be rewarded by Governor General A. VAN DIEMEN.

In the old Dutch records, preserved in the archives of Malacca, we find, in 1643, the inhabitants of Naning and Rumbowe, particularly those of the districts of Mullikey, Perling, and Inac, noticed as being in a very rebellious and disorderly state, refusing to obey their chief Rájá Merah, the first Panghúlú of Naning, on account of the banishment by the Dutch of one of their chiefs, named Meni Tuan Lelah Reawan, from the territory of Malacca: and complaining that the administration of justice was not according to their customs.

In 1644, the Dutch Government resolved to depute commissioners to Naning, in order to restore tranquillity, to take a survey of Naning and its districts, to apportion lands to the inhabitants, (who, it is worthy of note, are always styled "*Manikábowes,*" or settlers from Menángkábowe in Sumatra,) to in fuse intotheir minds the advantages resulting from habits of industry, to turn their attention to agricultural pursuits, to persuade them to "depart from the state of barbarism under which they then laboured," and finally, to furnish Rájá Merah, the chiefs and inhabitants there, with instructions how they were to conduct themselves towards the Government of Malacca in respect to the administration of justice in civil cases, and above all, to take cognizance of every criminal case that occurred there.

To fulfil the objects of this mission, Government selected senior merchant Snoueq. But citizen Snoueq, the minute drily observes, "brings in various excuses, saying he is unwell, and that the road to Naning is impassable, that his legs are bad, and that he is not proficient in the Malay language."

Shortly after this, Snoueq still persisting in his objections, an expedition is ordered to proceed to Naning, under Captain S. Alexander Mendos and Antonio Gonio Louis Pinjero, consisting of 50 Netherlands, and 60 Malacca soldiers, with 20 peons, to convey provisions and baggage, and a number of boats and boatmen—in all 180 men.

The following is the official account of the mission written by the Governor Jeremias Van Vliet, who, it appears, proceeded himself to Naning in the room of Snoueq.

"On the third day, about three hours before the sun went down, we arrived with the whole retinue at Pankallang Naning, as far as is navigable, with a boat. Here we rested during the night, and found Rájá Merah, with some of the principal chiefs of Naning, who shewed us every mark of respect and obedience.

"Early on the morning of the fourth, we marched forward with the whole retinue, through forests, to Melecque (Mullikey). We reached this place at 10 o'clock, with the principal part of the troops, and

awaited the arrival of our baggage. After taking some refreshments, we proceeded on our journey to Naning, and arrived at this place two hours before the rising of the sun. Rájá MERAH, with some of the principal chiefs of Naning, and a great concourse of people, came to receive us and pay their homage. They conducted us to Naning, and had a band of musicians marching before us.

"The inhabitants of Naning and the other districts under our subjection came to us to pay their homage. Thus every thing promised a favorable result to the object of our mission. The chiefs and inhabitants of Naning had constructed a sumptuous bungalow for our reception, and shewed us every attention and respect.

"We received their compliments with every token of good will, and so we past the day.

"In Naning we desired Rájá MERAH and the chiefs to be called; and pointed out to them the atrocities which had been committed by them and the inhabitants during the past year, viz. that murder and robbery were common practices with them, arising from no other cause than a state of ignorance and idleness. It is therefore adviseable, that they should devote their time to agricultural pursuits, such as planting a more considerable quantity of pepper or paddy. Were they to lead an industrious life, it would prove much to their benefit; malignity would then, no doubt, be entirely eradicated."

The following points were laid before them:

1st. "That INCHI WODDAT, one of the chiefs and head-men at Melicque (Mullikey), having proved himself unworthy of that situation, and on whom no confidence could be placed, it is required that they should select three qualified persons at Melicque, out of which number, one would be chosen to fill the vacant seat."

2nd. "That they should keep the river, from Pankallang Naning to Pankallang Nauwar, clear, and make it navigable for prows."

3rd. "That one-tenth of the produce of the Naning rice-fields should be paid annually, either in kind or money."

4th. "That Rájá MERAH, with the chiefs, should come down personally, or depute persons to pay their homage." (The records here are almost obliterated.)

5th. "That Rájá MERAH shall invite, by beat of gong, all the inhabitants in the districts under subjection, in order to ascertain if they have any complaints to bring forward against Rájá MERAH, or the other chiefs; and if they have no reason of complaint, notice should be taken of their disobedience."

6th. "That we should furnish Rájá MERAH and the chiefs with instructions, and point out to them the line of conduct which they

should invariably pursue, and how far their authority extends in the administration of civil cases."

"These points having been translated into the Malay language, we had it proclaimed, and made known to all people, through the medium of Rájá Merah, who informed us, that the inhabitants accepted these rules with due deference, but made some difficulty in complying with the contents of that paragraph which enjoins them to keep the river clear, for they consider themselves as his (Rájá Merah's) subjects, not his slaves. Rájá Merah further states, that the limited authority with which he is invested is not calculated to command obedience. But it is our wish, that Rájá Merah confer with the chiefs and inhabitants on the matter, and inform them that what we had resolved is principally to promote their interest. The clearing away on the banks of the river is a service which could be performed by four persons, and in a short space of time. The banks of the river should be cleared, widened, and made navigable from Naning to the town; but they are required to keep the river clear only as far as Pankallang Nauwar, from thence it will be the business of our inhabitants to preserve the cleanliness of the river. They ought to recollect, that this improvement would, in a great measure, promote the prosperity of Naning; and how convenient it would be felt by every body in the transport of paddy, *sirih*, and other produce. Perceiving their objection, we desired, that the inhabitants should be summoned by beat of gong, in order that they might consider this object more attentively. Rájá Merah and chiefs did accordingly hold a consultation with the inhabitants. We directed Alexander Mendos to be present at this meeting, and to inform himself of every circumstance which might occur, and instructed him how he should conduct himself towards these obstinate people.

"Alexander Mendos having appeared in the meeting, and hearing some of the *Manikábowes* making difficulties to obey the order regarding the clearing of the river, alleging that their houses were too far situated from the river, replied, that they should not murmur at such a trivial labour, considering that the Governor himself had left the town, and come up here for the purpose of punishing the wicked and disobedient, and protecting the innocent and faithful, it would therefore be very imprudent to resist his wishes. Mendos and Rájá Merah, impressed these salutary precepts on the minds of the inhabitants of the villages under subjection, who with one consent and loud voice exclaimed, "the will of the Governor of Malacca be done," and promised to be obedient to all his orders. In this manner did Rájá Merah, the chiefs, and inhabitants declare their willingness to accede to the rules which we had prescribed to them.

"We directed all the men in the districts under subjection to approach our dwelling, and demanded to know if they were satisfied with Rájá MERAH and the other chiefs, and would submit to their orders. If any person should be injured, and could procure no redress from them," (here again the record is undecipherable.)

"We addressed the people in such a manner that they unanimously declared, that they had nothing to bring forward against Rájá MERAH, and consented to place themselves under his control. We have in consequence read in the Dutch, Portuguese, and Malay languages, in the presence of the inhabitants of the districts under subjection, viz. Naning, Melicque, Inak, and Perling, the commission appointing Rájáh MERAH as our subordinate chief over the above-mentioned districts; and the tenor of the commission is noted down in the accompany copy.

"Rájá MERAH had selected three persons from each of the districts Melicque and Perling; out of which one will be chosen, in order to increase the number of the members of the council in Naning, and each of them should be a head man over a village.

"Whilst Rájá MERAH, the chiefs, and the inhabitants were holding a council, we took a survey of the lands and paddy-fields in Naning, and proceeded nearly so far as the forests of Rumbowe. It is indeed a fine and fertile land, bounded on both sides by forests. It is to be desired, that Malacca could possess such advantages. In the districts of Naning there is much waste and uncultivated land, which is well adapted for planting pepper. If we could put our plan into execution, it is certain that the Company will derive great profit in time.

"After the trial of many delinquents, there was one man, named U'ANG CAYA PER MATTU MERAH, who was once one of the chiefs at Naning; who, having evinced symptoms of disaffection, proceeded to Rumbowe, where he had spent his days in cock-fighting and gaming. This man was ordered to be apprehended and fined in our Council, with the concurrence of Rájá MERAH, in a sum of 50 crusadoes.

"The enormous crime committed by CONTELLA LASCARRA, late head man at Perling, for which he had been imprisoned here for a length of time, was also investigated in the presence of the said chiefs. He was condemned to pay a fine of 100 crusadoes. In failure of this, he shall be scourged and banished the territory of Malacca.

"The instructions, which we intended to furnish Rájá MERAH with, being ready, we intimated the tenor of the same to him and the other chiefs, and they appeared to be perfectly satisfied with them, which gives us every reason to hope, that they would promote the happiness and comfort of the people, and increase the confluence of the *Manikábowes*, when the villagers of other places shall hear Naning

is become a well-regulated Government, and the character of the inhabitants peaceable and industrious, and that vice is severely punished.

"Every thing at Naning has turned out to our wishes. Rájá Merah and the chiefs were very submissive, and the inhabitants very obedient to our orders."

Governor Van Vliet had not long to felicitate himself on the submissiveness and obedience of the inhabitants of Naning; for shortly after his return to Malacca, an extensive conspiracy was formed, in which they assumed a prominent part against the Dutch Government, in the denouement of which, two Dutch officers lost their lives at the hands of the natives. The following paragraph from the records gives us an insight into the method employed by the Dutch of this period, in "*persuading* the refractory Manikábowes to return from the state of barbarism under which they had the misfortune to labour."

Well might Lord Minto, the conqueror of Java, commit to the flames with indignant hands, those instruments of torture, so long a disgrace to a city over whose ancient ruins the British flag waved*.

This document is dated "Malacca, 16th August, 1644."

"What an abominable treason and conspiracy have we not discovered in Naning in the conduct of five Malays, named Inchi Itam, Bongsoe, Sillap, Poetara, and a slave of the name of Patchuim, who had been compelled by his master to join the conspirators against Malacca. We have often trusted Itam with letters to the chiefs at Naning and Rumbowe, but he has performed our commands in a very unfaithful manner, by laying secret schemes with the said chiefs against us, and three different times he swore fealty in favor of them, against our Government, that he would not discover and make known to us any plan which our enemy might project against our interest, and if we should purpose to despatch a force thither, he would give timely notice to them of our design. Moreover, he had undertaken to lead 1,000 *Manikábowes* to Malacca, in order to attack and destroy the settlement. All this he did, and dissembled with us. Inchi, Sillap, Bongsoe, and Poetara were for a considerable length of time our inhabitants, and were together with the troops where Captains Forsenberg and Menie were murdered; since which time, they have taken up arms against our Government, and threatened to murder us in our council

* His Lordship, after the taking of Java, presented Malacca with a full length portrait of himself, in which the burning of the instruments of torture is represented. The picture was formerly suspended in the Stadt-house, but now adorns the court-house of Malacca.

chamber, and to run a muck against any one who would oppose them. They did also pledge that they would set the town on fire, and retire to the country with their wives and children. We were long of intention to punish these traitors, but have with the advice of our council defered the execution thereof until the return of our commissioner SNOUEQ from Johore. But the following is now resolved:

"That INCHI ITAM be *tortured* to death, and his body be exposed on a gibbet."

"That SILLAP and BONGSOE be decapitated, and their bodies be divided into four parts, and exposed in several conspicuous places."

"That POETARA be beheaded, his head placed upon a gibbet, his body separated, and exposed in several conspicuous places. He has confessed to be guilty of horrid crimes."

"That PATCHIUM the slave, be acquitted, and set at large, as it is proved that he has not taken up arms against us, and has been constrained by his master to join the said conspirators. Moreover, he was the medium of discovering the conspiracy."

"God preserve Malacca and all states and fortresses from such evil-designing people."

"The villages of Naning and Rumbowe continue in a rebellious state, the blockade of the river Panagy, (the Rumbowe and Naning branch of the Lingí river,) by us is still carried on. Some days past, two Rumbowe people have been seized by our inhabitants in the river Muar. We had them executed; their heads were placed on stakes, and their bodies on gibbets."

"God grant that we may apprehend some more of these traitors, they shall all be dealt with in this way."

"By the disasters which had taken place at Naning, the continuance of the rebellion excited by the insolent *Manikábowes*, and the diffidence subsisting between this republic and the states of Johore, the minor trade of this place has of late been decreasing, the supply of all necessaries prevented, and the plantations along the river-side deserted and abandoned; for fear of the *Manikábowes*, nobody would venture to cultivate their gardens in those places. The revenue of the settlement has in consequence diminished, and the inhabitants very much disheartened. Even the people in the surrounding states are not exempt from fear on this acconnt. We shall find it therefore expedient to conclude a permanent peace with the states of Johore, by which means, it will be in our power to punish the Naning and Rumbowe people. We shall endeavour to treat all the subjects of the chief of Johore in a friendly manner, and permit them to visit our settlement without molestation."

The Dutch for a considerable period afterwards experienced much annoyance from the daring aggressions of these hardy natives, who advanced in hordes within a musket shot of the fort, and up to the very borders of the entrenchments, plundering and laying waste to the gardens and houses in the vicinity, and destroying the plantations at Bukit China. Government, at last, though not without considerable expence and bloodshed, succeeded in restoring tranquillity.

In 1651, the *Panghúlú* Sri Rájá MERAH was publicly thanked for his services in the apprehension of a runaway slave from Malacca, guilty of murder. In 1652, he, with his three sons and two of the principal chiefs of Naning, came down to Malacca, and presented to Government a quantity of pepper as "an ordinary tribute." On this occasion, he was honored in return by the gift of a Malay *sarasah*, one piece of red cloth, one of white cloth, and a piece of white bafta.

Inferior presents were likewise bestowed upon his three sons and the two chiefs.

In November, 1652, we find the following minute, which goes to disprove the power of inflicting capital punishment, without reference to the Malacca Government, which of later years the ex-*Panghúlú* DHOL SAYAD arrogated to himself.

"Pursuant to our order of the 30th October last, a letter was written in reply by Mr. EMANUEL DU MOULYN to the chiefs of Naning, conveying our sentiments and surprise at the atrocities which had been of late perpetrated at Naning, and the summary manner with which the offender was put to death by the commands of the chiefs in the case of Rajah MERAH's son-in-law, who attempted to destroy his wife and father-in-law. This we must confess is a horrid deed, but at all events, the offender should have been delivered into our hands, and a regular course of trial in our court be instituted against him. But when we take into consideration the sincere contrition expressed at what they have done, we could not but impute it to their ignorance, and it is therefore proper that we should not notice it this time with that severity and censure, which under any other circumstances it would be our bounden duty as lord paramount to exercise."

"We observe that there is another individual of the name of INCHI JUMAT, who has shewn many instances of insubordination, and is fully proved to have run a muck, and attempted the life of his chief at Naning. We have resolved in council, at the suggestion of the chiefs and inhabitants of Naning, and places subordinate thereto, that the said INCHI JUMAT be put to death, and sincerely trust, that after the

extinction of such a dangerous character as the said JUMAT, the district of Naning will revert to its former tranquillity and happiness."

The subjoined document, dated 27th May, 1664, bears upon the collection of the duty on the produce of Naning.

" The captain of Naning and the chiefs preferred in council a complaint against MARIA SILVENS, collector of the customs on *Sirih* brought from Naning, that he has not attended to the usual mode of levying the duty on this article."

" The measure which it seems he has adopted is this—after receiving the duty, he would detain the people about five days, until the quantity collected by him has been disposed of, by which means, the *Sirih* remaining on their hands, became unfit for consumption, and consequently not saleable. Through his negligence, the *Bongsal*, (revenue store-house) in which this article is deposited, and wherein the Naning people are compelled to take shelter at night, had become very dilapidated; nor has he troubled himself in the least to put the building in a proper repair for the accommodation of these persons, who were under the necessity of violating the prescribed rules, by taking up their lodgings in different parts of the town, which expedient has been attended with much inconvenience and disagreement amongst the Naning people."

" With a view to preserve good order and tranquillity, another individual shall be appointed in the room of MARIA SILVENS, who it would appear is also desirous to tender his resignation. We have therefore deemed it advisable, at the suggestion of Rájá MERAH, and the chiefs of Naning, to nominate ANTHONY PINJERO and MANUEL FRERE, as collectors of the duty on *Sirih* brought from Naning. The president of our council having observed, that MANUEL FRERE is more conversant in Malay language, and customs of those people, than the first mentioned individual, has considered it expedient to propose him for the performance of this duty, in which motion we unanimously concurred, and have consequently nominated the said MANUEL FRERE provisionally, to execute the functions of a collector of the aforesaid duty, and superintendent of the *Bongsal*, until our further orders."

" Early in 1680, the agreement made in 1641, by VAN TWIST, was renewed, during Governor General RIJHLOF VAN GOEN's administration by the then Land-voogd of Malacca, JACOB JARISSOON PITS, ' with the ambassadors of Naning and Rumbowe, on behalf of the king of Johore,' with these additions, viz. ' that a duty of ten per cent. *ad valorem* be paid to the Company on the sales of the pepper.' The Company promise to give an adequate subsistence to the chief at Naning, besides one-tenth of the collected revenue."

"Each boat coming down from Naning will pay a duty of one crusadoe to the Company." It appears by this treaty that the custom of dividing the property of the natives of Naning, dying without heirs, was introduced by the Portuguese prior to the capture of Malacca by the Dutch; we also find that all slaves flying from Naning to Malacca with intent of embracing the Christian faith will be emancipated, and the value of the same will be paid to their ancestors.

The Naning people likewise bound themselves not to trade with foreign nations, but to convey their merchandize down the river to Malacca.

In 1703, the Malacca Government appointed Sri Mahárájá JUARA MAGAT, as Panghúlú of Naning, for a service done to the king of Johore, which will be shortly mentioned, and in consequence of the incapacity and infirmities of the then Panghúlú Sri Rájá MERAH, who had forwarded to Government the Company's signet, which he had been permitted to use as a token of his delegated authority.

The following are the instructions received by the commissioners deputed for the installation of the new chief at Naning. They present a curious specimen of the native policy of the Dutch.

"Malacca, 5th May, 1703.

"Instructions given by BERNARD PHOONSEN, Governor and Director of the town and fortress of Malacca in Council, to PETER ANTHONY FIGAREDO, burgher, and INCHI AROOM, head man of the Malays at this place, for their guidance in respect to the installation of the newly nominated chief at Naning Sri Rájá MERAH, and the conduct which they should pursue during their stay at that place."

1st. "On your arrival at Naning, you shall wait upon the Orang Káyá Sri Rájá MERAH, in our name, and present him the accompanying letter, and congratulate him on his retiring from office, which we have granted him at his own request, and in consideration of his advanced age; and inform him, that his brother has been nominated to fill the vacant office, for which he has received the arms of the East India Company as a mark of his authority."

2nd. "You shall require the chiefs at Naning to pay all due respects and submission to the authority who holds the said seals, and with regard to the navigation of the river by boats, they shall invariably conduct themselves as we have desired."

3rd. "Two days after your arrival, you shall nominate and appoint the new chief in the name of the East India Company, and command all persons to pay every respect, and shew due submission to him; in failure thereof, they shall be liable to punishment."

4th. "You shall diligently inquire into the case of SEATHUM and his followers, in order that we might be thoroughly informed whether

he has been justly or unjustly accused, as we have heard repeated complaints against the present reigning chief; but you must not omit to caution SEATHUM, as well as his followers, to attend to all orders and requisitions enforced by the East India Company."

5th. "That the sentence, which shall be pronounced by them against an offender, must, in the first instance, be approved of, and confirmed by us, before it can be put into execution. Such sentences are also liable to be cancelled and altered by us, and our will must be punctually attended to."

6th. "They shall apprehend and send to town all evil disposed persons and offenders, who may from time to time take shelter in the districts of Naning. If resistance should be made on the part of these persons, they shall use violence in seizing them, for we would rather see them *put to death* than that one should escape with impunity."

7th. "No individual from town, or plantations on the river side, shall be permitted to proceed to Naning without previous intimation being given to the Shahbandar, or Malay translator, who will issue on application a written permission to that effect; and we direct that all persons, not furnished with such license, be ordered to quite Naning, and return to the place from whence they came."

8th. "The inhabitants of Naning shall be permitted to export and bring to market in town all sorts of minerals, timbers, fruits, &c., except *Sirih* leaves. Our reason for forbidding the importation of this article has been several times conveyed to them. In return they shall be permitted to take to Naning from hence all sorts of provisions and necessaries."

The following account of the circumstances attending JUARA MAGAT'S elevation is related on native authority.

Sultan ABDUL JALIL SHAH III., king of Johore, wrote a letter to the chief of the Malays at Malacca, then *Capitan Malayu*, DATTU ARU'M, stating, that one of his subjects, GANTA DELANGIT, had carried off one of the royal concubines to Malacca; and desiring him most earnestly to render assistance in wiping off this stain on his honor. The *Capitan* on the receipt of this epistle summoned JUARA MAGAT from Naning, and ordered him to seek out DELANGIT, to put him to death, and to bring down the concubine of the Sultán to Malacca.

To this, it is said, JUARA readily assented, but requested a *kris* from the *Capitan* for the purpose, who gave him the choice of the whole of his weapons, and on JUARA'S not finding one "lucky" enough, desired him to go to the armourer's shop in town, and make his own selection. JUARA turned into a Chinese shop, near the Trangueira gate, where after rejecting all the inlayed and beautifully damasked

weapons offered him by the armourer, selected an old rusty looking *kris*, blackened by the smoke and resin of the dammer torches, to the trimming of which it had been constantly applied. He then returned to the *Capitan*, and informed his astonished employer that the rejected weapon he held in his hand, was the *kris* destined to pour out the blood of DELANGIT as a sacrifice to the insulted honor of the Sultán.

With this wonderful weapon (fit companion for the enchanted sword of king ARTHUR), JUARA returned to Naning. But DELANGIT, hearing of his purpose, had already fled thence into Muar, and concealed himself with the concubine amid the fastnesses of that wild country. Thither the persevering JUARA tracked his victim, and coming up with him at the mouth of the river, plunged the fatal steel deep into his heart.

The concubine he conveyed in safety to Malacca, whence she was sent, with an account of what had occurred, by the *Capitan*, to the Sultán of JOHORE. The Sultán recommended JUARA to the Dutch government, who made him *Panghúlú* of Naning; and bestowed on him as mark of royal favor, two slaves, a man and woman; (from whom the *Súkú* or tribe at present known by the appellation of *Tigá Nenek* sprang;) a sword, termed *Ulár-kenyáng*, "the satiated serpent," a silk *bájú* or vest, and lastly, a tract of the Gominchi territory, hence called *Pembáshú Tungan*. To the *Capitan Malayu* was given a piece of land extending from Kleybang to the Sungí Baru river, and inland to Bertam. The title Sri Rájá MERAH, the sword, *Baju*, and a genealogical book, generally preserved in the families of Malayan princes and noblemen, called *Silselah*, have descended to JUARA's successors as a *Kabesáran*, or regalia.

JUARA MAGAT was succeeded, agreeably to the *Menángkábowe* law of succession, by his sister's son, KUKAH; to KUKAH succeeded EANGARANG or MULANA GARANG, JANGOT, TAMBAH, and ANJAK or BUKIT JOOTOR. The present ex-*Panghúlú* ABDUL SAYAD or DHOL SAYAD, succeeded his uncle ANJAK, in 1801, when he was confirmed in his office by the British Resident at Malacca, colonel TAYLOR.

When ABDUL SAYAD had control in Naning, the *Kabesáran* of his ancestors was kept in a house-shaped chest, and was only publicly produced once a year. Its contents were perfumed with the smoke arising from a censer of odoriferous gums, and washed with water and rice-flour, by the sacred hands of the *Panghúlú* himself. On their being exhibited, the superstitious natives, not even daring to look at these miraculous relics, fell prostrate with their foreheads pressed to the earth, exclaiming, *Dowlet, dowlet!*

The properties ascribed to the sword are those generally known by Malays under the term *Betuah*, which, among other meanings, has that

of any thing imparting invulnerability and irresistability to the wearer. Secret enemies are detected, by their involuntarily trembling in the august presence of the weapon. The silk *bájú*, it is believed, will fit none but the *Panghúlú* or the person destined to become his successor. And to this day, it is firmly credited by many of the Malays, that the elder brother of ABDUL SAYAD was rejected from the Panghúlúship solely on account of his inability to get his head through the neck of the vest, which is represented to be so small, as scarcely to admit of the insertion of two fingers.

The truth of the matter is, that he was set aside by the *Ampat Súkú*, on account of his unfitness, and unpopularity. How the ex-*Panghúlú* contrived to slip his large head through the silken vest must still remain matter of conjecture to the learned.

In 1795, the English took possession of Malacca and Naning; of the latter, under the same terms as the Dutch had held possession. In 1802, Colonel TAYLOR, the Resident at Malacca, made treaty with the ex-*Panghúlú* and the *Ampat Súkú*. Among other stipulations, it was agreed on that the *Panghúlú* chiefs, Menángkábowes or Malays of Naning, do pay one-tenth of the produce of the soil to the East India Company; but in consideration of their poverty, it is resolved, that instead of paying the tenth, the *Panghúlú* come in person annually to Malacca, and present 400 *gantams* of paddy to Government. And further, that "the *Panghúlú* and chiefs promise, in the name of the said community of Naning, that whenever the chief rulers happen to resign the Government, or any misfortune befal them, they shall in such case propose one of the nearest and most qualified of his family to the Governor of Malacca, for his successor; but it is not expected that such a proposal must always meet the Governor's approbation; on the contrary, it is optional with him, whom he thinks proper to appoint."

Colonel FARQUHAR became Resident of Malacca in 1803, and in 1809, reserved to the British Government, the power of inflicting capital punishment on criminals in Naning. The duty of one crusadoe, on boats coming down from Naning, was withdrawn.

In 1810, the Dutch again assumed possession of Malacca. In 1822, Governor TIMMERMAN THYSSEN, had caused a statement of the land's produce of Naning to be drawn out, and transmitted it to the Netherlands Government at Batavia, with the ulterior view of levying the tenth. But before their decision was received, the British flag was again hoisted at Malacca. This took place in April, 1825. Up to this period, the 400 gantams, in lieu of the tenth, had been annually paid by the different *Panghúlús* of Naning. In 1827, the *Panghúlú* and *Ampat Súkú*, came down to Malacca to pay their re-

spects to the new Resident, Mr. GARLING, who had been appointed in 1826. In 1828, Mr. LEWIS, Assistant Resident, proceeded to Tabú, the capital (if a village be so called) of Naning, with the view of making arrangements with the chiefs, for putting that territory on the same footing as the Malacca lands, which, in pursuance of Mr. FULLARTON'S plans, had been transferred, on the 15th of March, 1828, by the private landholders, for the aggregate annual sum of 17,000 Sicca Rupees, to Government, from the 1st of November, 1828, but afterwards fixed from the 1st of June, until such period as the British flag should continue to fly at Malacca. Mr. LEWIS was empowered to offer the *Panghúlú* the sum of 600 Spanish dollars, and each of the *Ampat Súkú*, 50 per annum, provided they would consent to transfer their lands to Government, in order that the tenth might be levied thereon, as well as on the Malacca lands.

These proposals met with a refusal.

In 1829, Mr. CHURCH, Deputy Resident, was sent to Sungí-puttye, on the Naning frontier, to confer with the *Panghúlú*, with instructions to make known to him that Naning was an integral part of Malacca, and that it was intended by Government to subject it also to the general regulations affecting the rest of the Malacca territory, but directed no immediate levying of this duty. He was further instructed to take a census, and to make it known, that all offenders, except in trivial matters, must be sent down in future to Malacca for trial. Mr. CHURCH, on the part of Government, offered the *Panghúlú* and *Ampat Súkú* pensions as a compensation.

The census was allowed to be taken, but the rest of these conditions met with an absolute negative.

When Mr. FULLARTON arrived, he wrote to the *Panghúlú*, who had not presented himself with the annual tribute, summoning him to Malacca, but without effect. An expedition was then proposed to be sent to chastise the sturdy chief; but deferred, pending a reference to the Supreme Government. The *Panghúlú* still further committed himself by the forcible and injustifiable seizure of a *Duson*, at Panchúr, within the Malacca boundary, the hereditary property of INCHI SURIN.

This man preferred his plaint to Government, and in consequence another message was dispatched.

The *Panghúlú's* answer set forth a determination to retain the *Duson*, affirming it to be his own property, and impeaching the right of Government to interfere. A proclamation was now published, declaring, that ABDUL SAYAD had forfeited all his claims, and was thenceforth no longer *Panghúlú* of Naning.

Such are the principal circumstances leading to the expedition in August, 1831, its failure, and the subsequent successful operations in 1832.

Tabu fell on the 15th June, 1832, ABDUL SAYAD having barely time to carry off his family and his *Kabesaran*. The chest in which these relics were deposited fell into the hands of the troops. The *Panghúlú* fled first to Condong in Rumbowe, thence to Míko, and finally to Passir, in Srimináti. Here he left his family, and has been wandering about the interior for some time past. After the evacuation of Tabu, he paid several pious visits to the tombs of his ancestors, who there lie buried; he has since returned to Srimináti, where he lives in indigence, and would probably come in on terms and deliver himself up to Government.

His private property and lands have been confiscated.

The *Ampat Súkú* fled to Sabang, but finally separated and sought asylum in the neighbouring states. The two Mantris, MELANA HAKIM and GOMPOR, who principally instigated their chief to rebellion, are at Míko, (since returned.)

Mr. IBETSON visited Naning in the ensuing October, and created 15 *Panghúlús* over the different *Mukims*, or parishes, into which the country is divided, and thereby abolished the ancient power of the *Panghúlú* and *Ampat Súkú*.

The office of these newly elected chiefs is to preserve peace and quiet in their respective *Mukims*; to examine into and decide matters of little importance. Cases of a heavy nature are to be referred invariably to Government, and not as formerly to the *Ampat Súkú*, or heads of tribes, whose authority is now at an end.

They are to assist in the collection of the revenue, and apprehension of criminals; and are constituted as authorized channels of communication between the Government and the peasantry.

They derive no further emolument from their office, than part of their own lands, and produce being exempt from duty: this is also enjoyed by the four priests of each mosque.

On the 27th of October, 1832, Government took the judicious step of placing Naning and its new system of internal administration, under the superintendence of Mr. WESTERHOUT, a gentleman not only eminently qualified for the task by his perfect knowledge of the Malay character and capabilities, but on account of his extensive influence with the principal persons of the district and neighbouring independent states.

The terms under which Mr. WESTERHOUT undertook the settlement of the country are principally as follows: that he shall have the whole

of the tenth collected in Naning, until the 30th April, 1834, his travelling expences to be defrayed on the usual scale. Mr. WESTERHOUT is to introduce and establish the collection of the tenth, he shall make a census of the population, number of houses, &c. The quantity of grain sown by each individual is to be ascertained by him; also the extent of ground belonging to those individuals who are exempt from paying the duty. He shall likewise ascertain the quantity and nature of the lands, lately the property of DHOL SAYAD, and send in a return to Government of the new *Panghúlús* and places under their authority. The expediency of a number of wells being sunk at intervals of half a mile apart, along the Naning boundary-line with Rumbowe and Johore, was also suggested by Government.

On the 9th of January, 1833, Mr. WESTERHOUT met the Rumbowe chiefs at Sungí seaport, near the frontiers of Rumbowe, to arrange the respective boundaries. The boundary line agreed on follows the ancient one as far as Jírat Gunjí, from thence as stated before.

The Rumbowe chiefs revived some old claims to the Ramoan Chinas, stating, that in their old boundary papers, the line passed from Qualla Lingí over Bukit Bruang, and through Ramoan China, &c. to Padang Chachar.

We also find the Rájá of Salangore making a somewhat similar claim, in 1804, encroaching on the Company's territories as far as Sungí Baru. (Vide ANDERSON's Considerations, page 203.)

They however readily ceded the point, when informed that according to all European copies of former treaties, the boundary-line in that quarter was the Lingí river, and that the Ramoan Chinas had always been private property under the Dutch and English Government.

The country, since the taking of Tabu, has been occupied by the Madras troops; but as its security has progressed, and the inhabitants have became more and more settled, the force has been gradually diminished. Distress and poverty are still too visible. These powerful agents, operating on a few desperate characters, have produced, in many instances, the natural results, robbery and murder. The newly-created *Panghúlús*, with families, crying out for food at home, and fearful for their own personal safety, are at present very far from being useful as a police: in time to come, after the machine has once received a proper impulse, the inhabitants returned to their rice-fields, and the ex-*Panghúlú*, now dwelling in the neighbouring state of Srímináti, disposed of, then the troops may be withdrawn, or concentrated in a centrical post, and the *Panghúlús*, with their *Mata Matas*, may then be found sufficient for the duties required of them; but at present they stand more in

need of support themselves, than they are able to afford it to the wretched rayats under them.

Most part of the above was written while in camp at Alor Gajeh, a place situated nearly in the centre of Naning, about 12 miles from the Rumbowe frontier, during part of 1832, and the beginning of 1833. Since this period, up to the present (1834), the inhabitants have, with few exceptions, returned to their native villages. The ex-*Panghúlá* came down from Sriminánti, and surrendered himself unconditionally to Government, on the 5th of February, 1834.

He has been permitted to reside at Malacca, and draw a salary from Government of 30 Sicca Rupees per mensem; has been sanctioned on this condition of his binding himself in 1000 Spanish dollars, and finding two securities in 500 Spanish dollars each, that he shall be forthcoming whenever called upon.

He has since this resided at Malacca, where he has received much attention from all classes of the native population. He is a hale, stout man, apparently about 50 years of age, of a shrewd and observant disposition, though highly imbued with the superstitions of his tribe. His supernatural efficacy in the cure of diseases is still firmly believed in, as that of certain kings of England was at no very remote period by their enlightened and scrofulous subjects; and his house is the daily resort of the health-seeking followers of Muhammed, Foh, Brahma, and Buddh.

The census of 1833-4, has exceeded those of former years, amounting to men, women, and children, 5,079. Although by the Muhammedan law, a Musalman enjoys the privilege of possessing four wives, provided he can maintain them, yet we find in Naning the number of males exceeds that of females by one hundred and sixty-one.

MONTESQUIEU, I believe, in a defence of polygamy among Asiatics, adduces as a cause the superior comparative number of females prevailing in the East. The population of Naning, like that of other Malayan states of the peninsula, is in a low state; in absence of other causes, generally assigned by political economists for this deficiency, may be ascribed the natural unproductiveness of the females: few bearing more than six children: the ravages of the small-pox, unchecked by inoculation or vaccination; the immoderate and constant practice of smoking opium, by those able to purchase this pernicious drug; and, perhaps, may be added, the poverty prevailing in many of its villages. The Malays, equally with other followers of Islam, are religiously bound to marry; hence we perceive few unmarried persons who have arrived at years of puberty. Prostitution and its attendant evils are extremely uncommon.

I have observed many instances of longevity in the interior ; seventy or eighty years is an age by no means rare. An instance of 120 years, has been related to me, on respectable authority, occurring in the person of DATTU PUAN, a native of Lubo Koppong, in Naning, who died some years ago at Sungí Baru. This truly patriarchal old man lived to see his descendants in the fifth generation.

Produce of 1833-4.—The last rice crops were not so abundant as expected, owing to a bad season, and the employment of the newly returned inhabitants in rebuilding their houses, repairing the *Ampangans*, or dams thrown across the rivers, for purposes of irrigation. The total produce of paddy amounted to 137,985 gantams. The tenth levied on this, and the other articles of produce, covered the expences of the district of Naning with a small overplus. The face of the country now presents every where the prospect of a plentiful harvest.

The Malacca lands, ceded during Mr. FULLARTON's administration, by the Dutch proprietors to the British Government, in 1828, have however by no means repaid the expence of holding them, being a heavy annual loss to the Company. This I think is principally to be attributed to the extravagant compensation sums paid yearly, for the tenure right to the proprietors. Other causes operating indirectly on the revenue, to account for a small portion of this deficiency, exist; for instance, the *Sirih farm*.

Collection of the Revenue.—The tenth* on the rice crops is levied in Naning much in the same manner as in the ceded lands, just mentioned, in the vicinity of Malacca.

When the grain is ripe, a person on the part of Government visits the rice-fields, attended by the owner, the *Panghúlú*, or *Mata Matas* of the village, and several of the oldest inhabitants on the spot, in order to agree on and assess its value. Regarding this point, a difference of opinion is naturally to be expected to arise between the taxer and the taxed. This is generally submitted to the arbitration of the *Panghúlú* and the village elders. But should these persons again assess the crop at a lower value than the collector's agent really thinks it worth, the latter has still the resource of offering to purchase the whole of the crop on the part of Government at the price the

* The sovereign's right to the tenth has been from time immemorial acknowledged in Malayan states. This custom is very ancient, and appears to have prevailed over a great portion of the known world, and among nations of a very different character and religion ; for instance, the Jews, the Gauls, the Chaldeans, the Egyptians, the Greeks, and the Romans. It was originally offered to the gods, and their priests ; and then to sovereigns, who not frequently united the sacerdotal functions with their temporal powers.

owner has justly valued it. This has been done in a few cases, I believe, and has been invariably refused. It is not therefore improbable, all circumstances taken into consideration, that not more than 7 or 8 per cent. at the most ever finds its way into the Company's godowns. The tenth in kind on paddy is sold whenever a good price can be procured for it on the spot, and the proceeds lodged in the treasury. The tenth on the other articles of land produce is levied at tolls placed at the entrances into Naning from Malacca, and there immediately sold.

Much inconvenience and loss is experienced by Government, through this uncertain mode of collecting the revenue. The tax itself too, as it rises with the produce, operates practically as a check to progressive increase in the cultivation.

A pecuniary compensation, or commutation, of the duty *on the sawahs, or wet lands*, fixed for a definite period, not less than five years, would be far more advantageous and convenient to both parties. It should be very moderate for the first period, during which the amount of the crops for each successive season should be carefully ascertained, as well as the increased quantity of land that would naturally be brought under cultivation. To such an arrangement the Naning cultivators are by no means averse, but they object to it with regard to the *ladang*, or dry land crops.

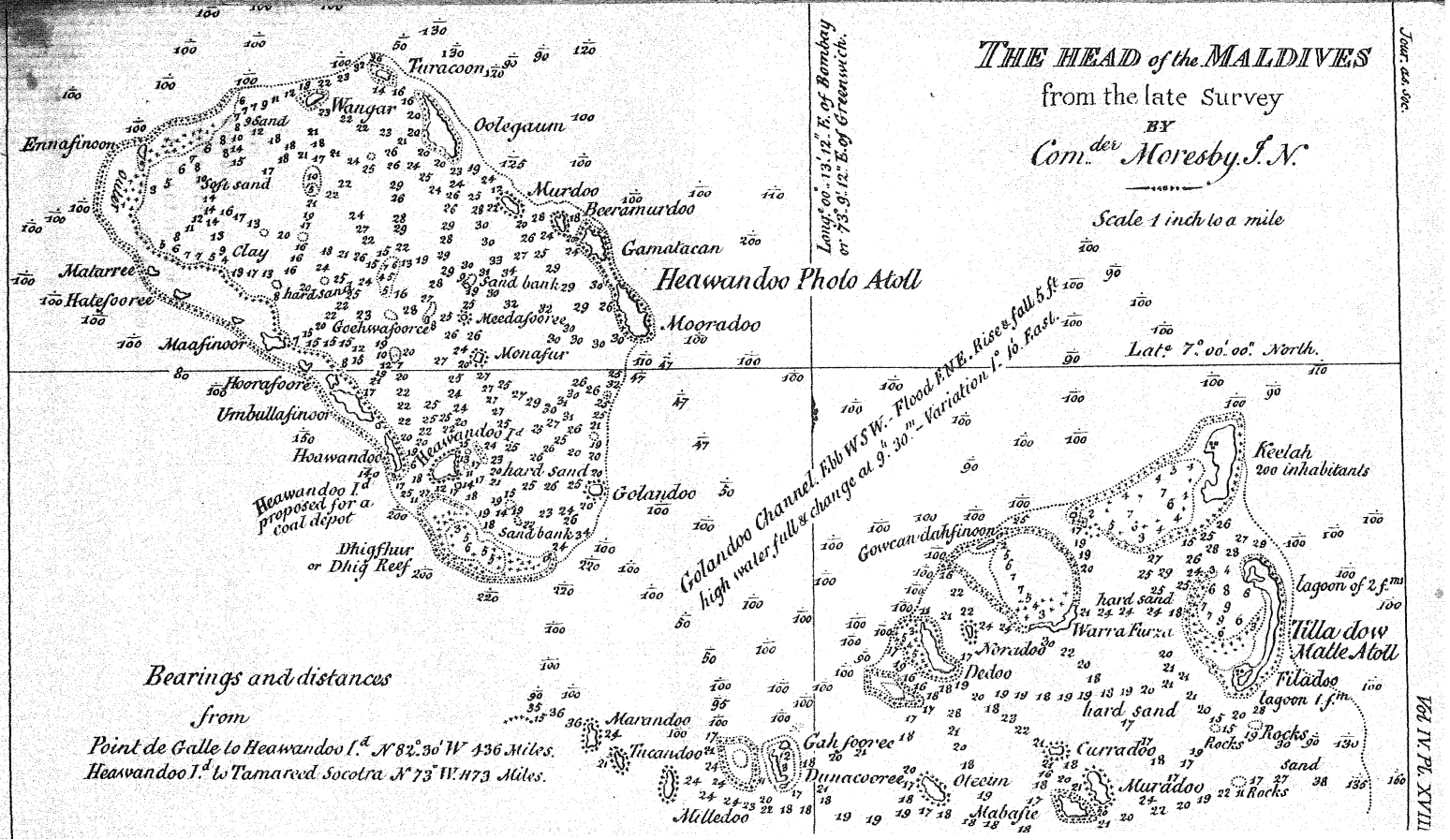
The desultory mode of cultivation known under the term *ladang*, of which Mr. MARSDEN has given an excellent description in his History of Sumatra, chap. iv., forms one of the principal obstacles to the introduction of the new land regulations into a Malayan country. Added to this, is the notorious dislike the Malays entertain to innovation and change, and their innate love of liberty and freedom from all shackles. They have a strong aversion to be bound down to the performance of any thing, even in matters which would afford them much amusement and pleasure, were they to act from free will and choice.

I am not aware of the *ladang* mode of cultivation offering any other advantages to the Malays, further than the charms of a wandering and shifting state of life.

The *ladang rice*, however, is affirmed by some to be sweeter and whiter, and to keep better than the produce of the *sawah*.

Although it is certain, that the chief present object is to improve and extend the agriculture of Naning, still its mineral resources should not be neglected.

At Bukit Bertam, gold was formerly procured, and considerable quantities of tin are known to exist throughout the district, particu-


THE HEAD of the MALDIVES
from the late Survey
BY
Com.der Moresby. I. N.
Scale 1 inch to a mile
Long.e 00°. 13'. 12". E. of Bombay
or 73°. 9'. 12". E. of Greenwich.
Lat.e 7°. 00'. 00". North.
Heawandoo Pholo Atoll
Golandoo Channel. Ebb W S W.- Flood E N E. Rise & fall 5 f.t
high water full & change at 9.h 30.m Variation 1.° 10' East.
Bearings and distances
from
Point de Galle to Heawandoo I.d N 82.° 30' W 136 Miles.
Heawandoo I.d to Tamareed Socotra N.° 73.° W 473 Miles.
Turacoon
Wangar
Oologaum
Erinafinoon
Sand
Soft sand
Murdoo
Beeramurdoo
Clay
Gamatacan
Matarree
Hard sand
Sand bank
Halesooree
Meedasoorve
Mooradoo
Goehwasoorce
Maafinoor
Monafur
Hoorafoore
Umbullafinoor
Heawandoo I.d
Hoawandoo
hard sand
Heawandoo I.d proposed for a coal depot
Golandoo
Sand bank
Dhigfhur or Dhig Reef
Keelah
200 inhabitants
Gowcandahfinoor
lagoon of 2 f.ms
hard sand
Warra Furzu
Nooradoo
Dedoo
Filadoo
lagoon 1 f.m
hard sand
Rocks
Curradoo
Rocks
Sand
Muradoo
Rocks
Oteeim
Mabasfe
Dunacoorree
Gahfoorree
Tucandoo
Marandoo
Mulledoo
Tour. del. &c.
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larly at Bukit Kúkúsan, Súngi Bílú, Ulú Pondoi, and Súndí, near Tabu. At the latter place, Mr. WESTERHOUT has opened a mine, of the first produce of which I possess a very favorable specimen. There is in fact but little doubt that the mines in the vicinity of Malacca, if scientifically worked by persons of some little capital and perseverance, would prove of much intrinsic value; and otherwise benefit the country, by attracting into it an enterprising and industrious population.

The want of capital, and consequent haste to convert the produce into cash, is the great drawback, not only to mining speculations, but to the cultivation of pepper, and other spices, requiring still more time before yielding any return to the cultivator.

Colonel FARQUHAR might perhaps have been a little too enthusiastic in affirming, that "nature has been profusely bountiful to the Malay peninsula, in bestowing on it a climate the most agreeable and salubrious, a soil luxuriantly fertilized by numerous rivers, and the face of the country diversified with hills and valleys, mountains and plains, forming the most beautiful and interesting scenery that is possible for the imagination to figure," &c. &c. But nothing could be truer and better founded than his observation, viz. "We have only to lament that a more enterprising and industrious race of inhabitants than the Malays should not have possessed this delightful region."

II.—*Description of Heavandoo Pholo, the Northern Atoll of the Maldive Islands. By Lieut.* T. POWELL, *I. N. Assistant Surveyor. Plate XVIII.*

GEOGRAPHICAL SITE. The Atoll Heavandoo Pholo, or head of the Maldives, situated upon the meridian of Bombay, and between the parallels of 7° 7′ and 6° 55′, north latitude, consists of twenty-two islands, two islets, and two sand-banks, besides several small shoals and two large barrier reefs; the latter form the boundary of the Atoll to the S. W., W., and N. W., and along the outer age are dry at low-water spring-tides: outside they are steep, having 50 and 60 fathoms close to them, and no ground at 150 fathoms, at the distance of 300 yards.

The northern or principal barrier has 10 islands, and two small islets on it: one of the latter, on its southern extremity, being close to Heavandoo: these are all situated on the inner side of the reef, having three or four, and in some places six fathoms water between them and its outer edge, with small channels for boats between each, formed by the natives having cleared away the coral rocks. Nearly in the centre of the Atoll there are three small islands; the eastern side is clear of

shoals, with the exception of two small patches between Gullandoo and Mooradoo; but on the western, there are several nearly dry, and some sunken patches, having from 3 to 10 fathoms on them. The soundings vary from 20 to 34 fathoms, the latter being the greatest depth of water obtained.

POPULATION. Of the twenty-two islands composing this Atoll, there are only seven inhabited, viz. Heavandoo, Koorafooree, Katefooree, Turracoon, Colligaum, Beeramerdoo, and Mooradoo. In the margin* I have noted the number of inhabitants and boats upon each, by which it will be seen, that the population, including men, women, and children, does not exceed 760 individuals. The boats are all employed in fishing: the trade between this Atoll and Tilla Dow Madow, whence they are supplied with such articles as they require, being carried on in those of the latter.

The islands are so similar in form and natural productions, that it would be a waste of time to describe them separately. I shall therefore give a sketch of Heavandoo, the island of greatest importance in this group; not so much on account of its size, as from its being the residence of the Sultán's Vizier when he visits the Atoll. It is of a triangular form, about one mile in length, and is composed of coral, elevated about 12 feet above the level of the sea. The western side is thickly covered with cocoanut and bread-fruit trees; and the northern and eastern, with thick brush wood: the interior, which is 3 or 4 feet lower than the sides, has been cleared by the inhabitants for the purpose of cultivating a small grain called Bimbí. The supply, however, which with the exception of a few sweet potatoes, pumpions, and limes, forming the only vegetable production of the island, is not sufficient for their support. The village, consisting of about 50 huts and 150 inhabitants, stands on the S. W. side. The huts, surrounded by spacious inclosures, are in general constructed of a frame-work of the wood of the cocoanut tree, the interstices filled up with leaves stitched together, and the roof neatly thatched with the same material. In the vicinity there are good paths intersecting the island in different directions, which, being kept remarkably clean by the women, form

* *Island.*	*Population.*	*No. of Boats.*
Heavandoo,	150	6
Koorafooree,	160	5
Katefooree,	70	3
Turracoon,	50	2
Colligaum,	150	4
Beeramerdoo,	30	2
Mooradoo,	150	5

pleasant walks, shaded from the sun by the thick foliage of the cocoa-nut and other trees. Like the natives of the other Atolls they gain their livelihood by fishing. Cocoanuts, and the fish called by them Goom-le-mus (Boneta), which are caught in great quantities, form their principal food: rice, being imported, is very scarce, and only procurable by the better class of inhabitants. Fresh water is plentiful, wells having been dug in almost every quarter of the island; but the best is procured from those situated in the burying ground. Fowls are abundant on all the islands, but not easily procured, being remarkably wild and difficult to catch, and the natives too indolent to take the trouble necessary to secure them. Money, for which they have little use, will not fetch its full value; rice, tobacco, and betel-nuts being the best medium of barter.

WEATHER.

October. The winds moderate and variable from W. S. W. to N. with cool, pleasant weather, and occasional hard squalls, accompanied by heavy showers of rain.

November. Light breezes from N. N. E. to N. N. W., and occasional squalls from the eastward, until the 22nd, when dark, cloudy tempestuous weather and incessant rain set in from the W. N. W. On the 27th, it cleared up, and continued fine for the remainder of the month.

December. Moderate breezes generally from E. N. E., with pleasant clear weather, occasionally from E. S. E., with squalls and rain.

During these three months, the mean temperature of the atmosphere ranged from 80° to 84°, frequently decreasing in the squalls to 78°.

The tides are extremely irregular, and at all times influenced by the prevailing winds and currents.

During the strong westerly breezes, the flood set to the eastward, and continued to run for the greater part of the day; but when they moderated, the ebb, in like manner, set to the westward, the water falling 6 or 7 inches lower than I had ever seen it before even on the springs.

In moderate weather, when the tides flow with somewhat greater regularity, the ebb always runs an hour and a half longer than the flood.

The rise and fall of water is then about five feet, and the velocity about a mile and a half per hour.

In October, November, and December, the current to the westward of the Atoll set to the southward, at the rate of 36 miles per day: the natives say, that it commences about the middle of September, and continues to the end of December, when the easterly winds set in, then turns to the westward, and runs in that direction until April.

Of this group, I conceive Heawandoo Island is better adapted than any other for a coal depôt: it lies nearly in a direct line between Point de Galle and Socotra, at about one-third of the whole distance from the former place, is easy of access in every direction, and possesses safe anchorages for ships and steamers in all seasons. During the S. W. monsoon, a vessel could anchor on the east side of the island between it and a small reef, dry at low-water; in the N. E. monsoon, the best anchorage is in the channel between the island and the south barrier reef in 16 or 17 fathoms, sand and rocks. Opposite both these anchorages, there are good landing places for boats, which are procurable in sufficient numbers, and may easily be made available for the landing or shipment of coals, &c. The natives, who are civil and peaceable, might I think, be induced to work for a small hire, such as rice, tobacco, &c. or any other remuneration they might consider adequate.

In approaching Heawandoo Pholo Atoll, from the eastward, a vessel ought to sight Kilah, the northernmost Island of the Tilla Doo Matte Atoll, and then steer across the channel to Heawandoo Island, passing close to Gullandoo, to avoid the small patches between it and Moordoo.

III.—*Examination of a Mummy Head, supposed to be brought from Egypt by Lieut.* ARCHBOLD. *By Dr.* GEORGE EVANS.

[In a letter to the Secy., read before the Asiatic Society, July 1, 1835.]

[The mummy preparations, to which the following note refers, were presented at the meeting of the Asiatic Society, the 3rd Sept. 1834. There were two wrappers, supposed to contain the sacred *Ibis*: one of these was opened in the presence of Drs. GRANT, PEARSON, BRAMLEY, and EVANS. The head, being in a decayed state, was, after taking a sketch, to shew the mode of dressing the hair, given to Dr. EVANS, who himself kindly undertook to clean it as an osteological specimen for the Society's museum.—ED.]

In returning these relics of antiquity, I have again to offer an apology for having detained them so long in my possession; they are at length put up as preparations, and as such will, no doubt, remain many years in a good state of preservation.

In my examination of the smaller, I have so far succeeded as to shew satisfactorily that four birds are embodied in the mass we supposed to be the mummy of the sacred *Ibis*. With the aid of the marks I have made, you will be able to distinguish eight distinct feet, with their toes and claws, severally attached; also three heads: the fourth, I take for granted, is there also, and seated below the parts already exposed, but the crumbling and decayed state of the mummy renders

its display somewhat difficult, and any attempt to bring it into view would, I fear, endanger the spoiling of the preparation. I therefore thought it best to leave it unexplored. What description of birds they are, it is difficult to say; the form of the heads and mandibles would lead me to pronounce them Plovers, but for the toe at the back of the foot, which is altogether wanting in the genus *Charadrius*; it is therefore not improbable they belong either to the Rail or Tringa family. Whatever they are, it is evident they must have been enclosed when very young, and barely fledged; for I can detect no quill feathers or traces of any having been attached to the wings, although the smaller feathers are closely matted together, and distinct enough. What further tends to confirm this opinion is, the great disproportion of the bones of the wings to those of the legs and other parts of the body—a discrepancy common to all young birds before they attain the power of flight. I am consequently disposed to consider them as nestlings, and think it not unlikely that a variety of birds, besides the *Ibis Religiosa*, might have been deified by the ancient Egyptians.

In detaching the birds from the enveloping bituminous matter, I met with a seed of the common castor oil plant, apparently in a good state of preservation. As it is a curious circumstance, I have enclosed it in a small phial along with the fragments of Beetles you sent for my inspection: these latter appear to be portions of a small kind of common *locusts*; elytra of some kind of *Buprestis*, and pieces of a species of *carabus*; but in their mutilated condition it is impossible to identify any of them with existing specimens.

The head is that of a female, rather below the ordinary stature of women, and I should say about 20 or 22 years of age, judging from the best criterion, the teeth, and the little attrition they seem generally to have undergone. The dentes sapientiæ in both jaws are only partially advanced, which with the profusion and colour of the hair, and the tiara kind of form it is drest in, I think are sufficiently indicative of youthfulness. The lineaments of the face must have been small, compressed laterally, and much sunken below the eyes, for the sinuosities beneath the orbits are remarkably deep, and the malar bones very angular and projecting. The forehead is low, and though straight for its extent is by no means ample, giving a facial angle of about 78°, indicating no extraordinary development of the intellectual and reflecting faculties, and an approach to what Camper would call the minimum of comeliness; but the angle is evidently diminished by the great protrusion of the upper maxilla, from the nasal spine, of which the measurement is made in taking the facial line.

The nasal aperture is wide and capacious, and nearly circular, owing it would seem to the very divergent state or distance of the nasal processes of the superior maxillæ from each other; the separation being to the full extent of an inch, which is an unusual width for so small a skull. Nasal bones large and prominent, with a good bridge-like convexity. The styloid processes, which in a full grown male adult have often only a ligamentous connection to the temporal bones, have here an ossific union, and are withal unusually long and firm, considering the age and sex of the individual. The great foramen at the base of the skull is elongated from before backwards, and would seem to correspond with the compressed sides of the head, and projecting state of the occipital bone, on which the organs of amativeness and philoprogenitiveness are rather fully developed.

The only marked peculiarity observable in the lower jaw is the recedent chin, which being on a contrary inclination to the facial line, is a further departure from the Grecian ideal model of beauty, while it is a strong characteristic mark of Ethiopian descent.

The vomer or bone forming the partition of the nose was found loose in the cranial vault, and there is little doubt, must have been forced there at the time of embalmment, when the ethmoid bone was broken down, to allow of the removal of the brain and contents of the skull, which, it is evident, could only have been disposed of through the chamber of the nose.

In my examination of this head, it appears to me, that the leading characters of the Caucasian variety of the human race (under which both ancient and modern Egyptian are included) in this individual instance are far from being prominent, or distinct; and as some of the peculiar traits that characterize the Ethiopian formation, (taking it in its wide extended sense,) on the other hand, are most conspicuous, it is not unlikely that the subject of comparison may be of mixed origin, and probably of Egyptian and Abyssinian descent.

IV.—*Memorandum on the Fœtus of the Squalus Maximus. By Dr.* J. T. PEARSON, *Curator.*

This specimen of the fœtus of a shark having been sent to me by Mr. J. C. WILSON, I have put it up in spirits, and have now the pleasure of presenting it, in his name, to the Asiatic Society.

The species appears to be the Squalus Maximus of Linnæus; and Mr. WILSON states in his note that "a shark of 11 feet in length was

caught by the *Middies* of the Hashemy on her last voyage here: on being cut open, there were no less than 43 youngsters disclosed to view, all alive and frisky. Two of them were *embalmed* in the way you see by Mr. DAWSON one of the middies, and by him presented to me. It was the opinion of those on board, from the appearance of the young folks, that they must have been occasional visiters of the salt ocean, and had only retired to rest when discovered."

Upon this latter point it may be remarked, that setting aside the impossibility of such a thing on other accounts, the specimen is, so far as a mere external examination can decide, in the fœtal state; and, consequently, unfitted for a residence for any time, however short, in the water. Nor is such an idea in accordance with what we know of the ovoviviparous fishes, being able to seek for nourishment themselves, and altogether independent of their mother, immediately upon their being ejected from the womb.

June 3, 1835.

V.—*Result of the Observations made on the Tides at Madras, from the* 31*st May, to the* 10*th October*, 1821, *by means of a Tide-guage fixed near the north-east angle of the Fort.*

Phases and Age of the Moon.	Time of High-water.	Surface of the Water below the Guage mark.						Difference between high and low water.	
		At H. W.		At L. W.		Mean level.			
	h. m.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
Full and Change.	8 58	5	3¾	7	11	6	7⅛	2	7¾
2nd — 16th, ..	9 26	5	1¾	8	1	6	7¼	2	11½
3rd — 17th, ..	10 0	4	7½	7	8¾	6	2⅛	3	1¼
4th — 18th, ..	10 30	4	9½	8	3¼	6	6½	3	5¾
5th — 19th, ..	11 0	4	10½	8	1¼	6	5⅞	3	2¾
6th — 20th, ..	11 42	4	11¾	8	2	6	6⅞	3	2¼
7th — 21st, ..	12 12	5	3½	7	11¾	6	7⅝	2	8¼
8th — 22nd, ..	12 30	5	4½	7	9½	6	7	2	5
9th — 23rd, ..	1 21	6	1½	8	0	7	0¾	1	10½
10th — 24th, ..	3 6	6	4½	8	0	7	2¾	1	7½
11th — 25th, ..	4 45	6	6	8	3	7	4½	1	9
12th — 26th, ..	5 24	6	7	8	5¼	7	6⅜	1	10¼
13th — 27th, ..	6 25	6	4¾	8	4¾	7	4¾	2	0
14th — 28th, ..	7 11	5	11	8	0½	6	11½	2	1
29th, ..	7 37	5	8¼	8	0¼	6	10⅛	2	4
Average mean level and lift, ..		5	6½	8	1	6	10	2	6½

The Madras Herald of the 3rd June, 1835, whence the above table is extracted, remarks: that "until the 29th of July, the observations

were frequently interrupted; but that after that date, they were made daily, at every tide, in every 24 hours: and as there appears some difference in the results obtained from the subsequent period, they are given in the following statement."

Circumstances of the Tides from 29th July to 10th October, 1821, *both inclusive.*

Age of the Moon.	Time of High Water.	Surface of the Water below the Gauge mark.						Difference between high and low water mark.	
		H. W.		L. W.		Mean.			
	h. m.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
Full and Change.	8 54	5	4½	8	4½	6	10⅜	2	11¼
2nd — 16th,..	9 24	5	0½	8	4½	6	8¼	3	3¾
3rd — 17th,..	9 54	4	11¾	8	3	6	7⅜	3	3¼
4th — 18th,..	10 24	5	0⅛	8	2	6	7	3	1⅞
5th — 19th,..	11 0	4	10½	8	1	6	5¾	3	2½
6th — 20th,..	11 42	4	11¾	8	2	6	6⅞	3	2¼
7th — 21st,..	12 12	5	3½	7	11¼	6	7⅜	3	8¼
8th — 22nd,..	12 50	5	4½	7	9½	6	7	2	5
9th — 23rd,..	1 21	6	0⅛	8	0¾	7	0⅜	2	0⅞
10th — 24th,..	3 6	6	4½	8	1⅛	7	3	1	8⅞
11th — 25th,..	4 24	6	6	8	4	7	5	1	10
12th — 26th,..	5 24	6	7	8	5½	7	6¼	1	10½
13th — 27th,..	6 18	6	4	8	4⅜	7	4¼	2	0⅜
14th — 28th,..	6 48	5	10½	8	2¾	7	0⅜	2	4⅝
29th,..	7 37	5	5	8	1¼	6	9½	2	8¼
Average level and lift, ..		5	6½	8	2¼	6	10¾	2	7¾

" Although this statement appears less anomalous than the last, in some respects, it is not so in all; and as the other has the advantage of including the period of the long shore winds and strong southerly currents, it is a better average for the whole season than the last."

[*Note.*—It would have been more satisfactory if the state of the moon's declination, parallax, &c. had been attended to in the period selected for the above observations. Still, however, the table will be useful, as a reply *tanti* to the desiderata of the Rev. Professor WHEWELL, regarding tides on our Indian coasts, which was published in the first volume of the Journal. We wish we had similar information from other points on the coast, and especially from the other side of the Bay; and we cannot let the present opportunity pass of bringing the subject to the notice of our friends at Chittagaon, Rámrí, Moulmein, Penang, and Malacca. A single period of a complete lunation, carefully observed as to the direction, velocity, rise, and precise time of the day, and night tides, noting also the time of the moon's meridional passage, would be useful, and would cost but little trouble. All who have seen Professor WHEWELL's laborious map of the tidal wave, traced in its course over the whole surface of the globe, in the last volume of the *Transactions of the Royal Society*, would, we are confident, willingly contribute to the perfection of so interesting and useful a problem.—ED.]

VI.—*Further Notes and Drawings of Bactrian and Indo-Scythic Coins.*

By JAMES PRINSEP, *Secy., &c.*

Various causes have prevented the continuance of my imperfect notes on the numerous and highly curious coins which have passed under my inspection, since I last ventured my observations on the KANERKOS and KADPHISES group, as connected with the Manikyála Tope. Want of leisure to attempt the engraving of so many plates, and the desire to profit by a farther collection, of which I had received notice from Shekh KERÁMAT ALI', but which has not yet reached me, were among the principal causes of my dilatoriness. Some little deference however was also due to many of my subscribers, who complained, that I was deluging them with old coins! Having at length found time to engrave the first six plates of my proposed series, in elucidation of the principal new coins of Dr. GERARD's, KERAMAT AL'I'S, and Gen. VENTURA's splendid discoveries, I cannot refrain from putting on record the little I have to say regarding them; the rather as we may soon expect to hear from Paris of the reception General VENTURA's collection has met from the savans of that city, many of them so eminent for this branch of enquiry; and we are, on the other hand, expecting a fresh memoir from Mr. MASSON, which might anticipate some of the discoveries I would fain claim for myself, in this fair and highly interesting game of antiquarian research! Little indeed can I claim as my own, save the labour of classifying the coins, as they have come down at successive intervals—two or three hundred from KERA'MAT ALÍ, forwarded through Captain WADE; then as many more from the late Doctor GERARD*, brought down by MOHAN LÁL, who assisted him in procuring them; and lastly, the rich spoils entrusted by Gen. VENTURA to the Chevalier ALLARD for conveyance to Paris. The careful examination of the whole has brought to light the names of several princes unknown to history, and some few not included in the very curious and novel list of Mr. MASSON, published in the 3rd vol. of this Journal. It has also enabled me to appropriate to their right owners many of the coins of Lieut. BURNES and other collectors, engraved in former plates: further, it has furnished me a clue to the Bactrian form (if we may so call it) of the Pehleví character, which is found on the reverse of many of these coins; and lastly, it has lain open a perfect link and connection between what we have hitherto called the Indo-Scythic

* The death of this zealous and indefatigable traveller has not yet been recorded in these pages. I trust that his brothers, whose labours have always been equally prominent in the cause of science, will favour me with the materials for a worthy obituary of their lamented brother.

coins, with corrupted Greek inscriptions, and the Hindu coins attributed with reasonable certainty to the Kanouj dynasties, immediately anterior to the Mahomedan irruptions of the 11th century. In a few more years we shall doubtless have the whole series, from the time of ALEXANDER downwards, fully developed :—at present in these detached notices we can expect to do no more than hazard fresh conjectures, and wipe out former errors as we advance.

There are but few authors to assist us in our task, and the passages from them have been so often repeated, that it will be unnecessary again to quote. Neither BAYER's work nor the Baron DE SACY's are in our library : but, I have to thank Professor WILSON for kindly sending me sketches made by himself of the Bactrian coins, depicted in the former author, and in SESTINI and VISCONTI, several of which I am able to recognize. Of individual friends, who have favored me with their aid in furnishing specimens and information, I cannot omit mentioning Captain C. M. WADE, Dr. SWINEY, and Col. STACY* : the services of the latter numismatologist will be more fully appreciated when we come to talk of Hindu coins. In Bactrian, the field is of course less open to collectors on this side the Satlej ; yet not a few very fine coins have been picked up even within the limits so successfully run over by Col. TOD himself.

The coins of the two first princes of Bactria, by name THEODOTUS the I. and II. are yet unknown ; perhaps they never struck money, but were content with the Syrian currency then prevalent. With EUTHYDEMUS begins our collection—a purely Grecian coinage, bearing only Greek inscriptions, and, as far as hitherto known, all of silver. The coins of DEMETRIUS are more rare, but equally beautiful with those of his predecessor, and supposed father. HELIOCLES, the prince introduced on the authority of VISCONTI, will, I think, turn out to be our AGATHOCLES. With MENANDER begins the system of native legends on the reverse, which is followed up without intermission throughout the whole series to the barbarous KADPHISES. Some only of the coins of EUCRATIDES have a Pehlevi legend, as will be hereafter explained.

As the majority of the coins now to be introduced have these native legends on the reverse, it will better enable us to describe them if we begin by explaining what we have been able to make of the alphabet of this native language ; which, from its marked difference from other types of the same character, I have ventured to term *Bactrian-Pehlevi*.

* Of Indian coins, my list of donors would be considerably swelled; but it would be too like ostentation to enumerate them in this place.

Mr. MASSON first pointed out in a note addressed to myself, through the late Dr. GERARD, the Pehlevi signs, which he had found to stand for the words *Menandrou, Apollodotou, Ermaiou, Basileos*, and *Soteros*. When a supply of coins came into my own hands, sufficiently legible to pursue the inquiry, I soon verified the accuracy of his observation; found the same signs, with slight variation, constantly to recur; and extended the series of words thus authenticated, to the names of twelve kings, and to six titles or epithets. It immediately struck me that if the genuine Greek names were faithfully expressed in the unknown character, a clue would through them be formed to unravel the value of a portion of the Alphabet, which might in its turn be applied to the translated epithets and titles, and thus lead to a knowledge of the language employed. Incompetent as I felt myself to this investigation, it was too seductive not to lead me to an humble attempt at its solution.

In Plate XX. are contained the whole of these corresponding legends, Greek and Pehlevi, collated from a very numerous collection, and deemed to be of sufficient authenticity to be assumed as the data of this inquiry. At the risk of being thought tedious, I will proceed to detail, letter by letter, the authority upon which each member of the new alphabet is supported.

1. 𐭠, *a*. No less than four names, viz. *Apollodotus, Antimachus, Antilakides* and *Azos*, commence with the Greek *alpha*, which in all four cases is represented by the Pehlevi character 𐭠. To this, therefore, there can be no reasonable hesitation in ascribing the value of the initial *a* or *alif*, although it will be seen presently, that there is another *a* more conformable with the ordinary Pehlevi *a*. It must be remarked that the present letter only occurs at the beginning of words.

2. 𐭡, *e*. Two names, *Ermaios* and *Eucratides*, begin with the *epsilon*, and are found in the Pehlevi to have equally the initial 𐭡; this, on consideration, may be a variation of the initial vowel above given, to endue it with the sound of *e*. Another form of the same letter 𐭢 occurs in one or two cases, expressing *u*; but the examples of these being too few to inspire certainty, I merely throw out the remark as a conjecture of analogy with the application of the initial *alif* of the Persian.

3. 𐭯, *o*. The next circumstance of note is, that every word, without any exception, ends in the letter 𐭯, sometimes written 𐭰. The latter may perhaps be called the finished or capital character, bearing an analogy to the Devanágari letter, which is completed by a stroke on the top, as this is by one below: for we shall find that most of the other letters admit of the same addition. 𐭯, then, I have supposed to represent the terminal 𐡄 *h* of the Hebrew; or the short *omicron* of

the Greek, chiefly because I find upon the later series of coins bearing native words in Greek characters, which I described in my last Essay, (JOURNAL, III. p. 436;) that every word there ended in *o*; and, as I then remarked, M. BURNOUF explains that sound, in the *Zend*, to be the constant representative of the masculine nominative termination of the Sanscrit *as*, or Greek *os*.* The letter 𐭯 never occurs in the middle of a word, as far at least as my experience proves. Some resemblance exists between it and the *Zend o*; but no letter in the known *Pehlevi* alphabets can be compared with it.

4. 𐭥 or 𐭦, *m*. Of this letter we have three examples; one initial in *Menandrou*; two medial, in *Ermaiou* and *Antimachou*: there can be no doubt therefore of its being equivalent to *m*; although it differs essentially from all the recognized forms of this letter in the *Pehlevi* alphabets of sculptures and coins. It should be remarked, however, that in the case of *Menandrou*, it is affected with a vowel mark, 𐭩; which, for reasons afterwards to be brought forward, I suppose to be the short *i* or *kasr*. Sometimes a dot is seen under this letter, which may have the power of some other vowel, probably the short *a*.

5. 𐭡, *z*, *j*, or *y*. This letter occurs in *Azou*, 𐭯𐭡𐭵, and in *Ermaiou* 𐭯𐭡𐭥𐭩𐭵: wherein it represents the sound of *z* and of *y*. It is analogous therefore to the Sanscrit झ, which is pronounced both as *j* and *y*. The Greek and the Hebrew have only the letter *z* for the former sound. Nothing like this letter is found in the other *Pehlevi* alphabets, in the same position.

6. 𐭯, *p*. Of this character, two examples are found; one in *Apollodotou*, 𐭯𐭪𐭤𐭫𐭵; the other in *Philoxenou*, 𐭯𐭩𐭤𐭪𐭧𐭯 where it probably stands in lieu of the aspirated *p*.

7. 𐭩, *n*. Of this letter we find instances in *Menandrou*, 𐭯𐭩𐭩𐭱 (*Minano?*) and in the example of *Philoxenou* last cited. There are others less decided, and some uncertainty prevails through the apparent substitution occasionally of an *l* for an *n*. The Pehleví alphabet of sculptures has nearly the same form of *n*.

8. 𐭪, 𐭤, 𐭫, 𐭯, 𐭬, 𐭵. In the Chaldaic, and its derivative alphabets, so much similitude exists between the characters representing *k*, *b*, *d*, and *r*, that it is sometimes difficult to distinguish them. On the earlier and more perfect coins before us, this difficulty is increased much by the circumstance of the dies having been cut by Greek artists, who were in all probability ignorant of the Pehleví tongue, and who therefore must have copied carelessly from imperfect samples furnished

* "Dans les anciens manuscrits *Zend*, *ô* final représente la syllabe Sanscrite *as*, comme en *Pâli* et en *Prâcrit*,.... l'*ô* long se trouve d'ordinaire à la fin d'un mot."—*Obs. sur la gramm. de Bopp, par M. Eug. Burnouf.*

by their native underlings. We have in our own copper coinage, similar and notorious examples of the Nágarí character so badly executed, that few even in the present day could certify the letters intended. In the more recent coins, and in proportion as the Greek deteriorates, the Pehleví improves; and our best examples are derived from the coins of the unknown AZOΣ. Guided by these, rather than by the strict analogy of the Chaldaic, I would venture to appropriate 𐭓 to *k*; 𐭁 and 𐭃 to *d*; 𐭓 and 𐭥 to *r*. As far however as examples go, 𐭓 or 𐭁 seems to stand indifferently for the two former, and for *t* likewise! Thus in the two last syllables of *Eucratidou*, we find 𐭥𐭁𐭒.. *(..tido?)* In the same of *Apollodotou*, we have 𐭒𐭓𐭉.. and 𐭒𐭓𐭁.. *(dato?)* In *Antila-kidou* 𐭒𐭓𐭋𐭥.., the place of *k* is assumed by a letter, different from any hitherto found as such, and more like that we have on slender grounds set down as an *s*. 𐭋 may be the *k* affected by a vowel mark, or with an *r*, as it occurs also in *Eucratidou*.

It is only on convention, therefore, that I shall in future reserve

8. 𐭓, for *k* (and perhaps *g*).

9. 𐭁 or 𐭃 for *d* (sometimes misused for *t*?).

10. 𐭓 or 𐭥 for *r*.

The same confusion will be perceived in the uppermost of the *Nakshi-Rustam* inscriptions in KER PORTER's Travels, the most faithful representation of those antiquities which we possess. Many reasons would induce me to suppose this alphabet to be the same as ours, the *k*, *l*, *d*, and *r* are so nearly allied; but the *m* forbids their union.

11. 𐭋 and 𐭍, *l*. Here again is a perplexing case: the latter occupies the place of *l*, in *Apollodotou*, *Lysiou*, *Azilisou*, *Antilakidou*: but the former occurs in the word for 'king' 𐭥𐭋𐭓𐭠𐭱𐭥 *(malakáo)* passim. It might be an *h*, and the latter word 𐭥𐭍𐭓𐭠𐭱𐭥 *(maharáo)*; but of this we shall have to say more anon: at present I am constrained to preserve both forms under the head of *l*.

12. 𐭯, *f*. This letter occurs on no coins but those bearing on the reverse the Greek φ; as *Kadphises*, *Pherros*, &c. It resembles considerably the common Pehleví form of *p*, and is only seen on the latest groups of coins; but it is common on the inscriptions of the cylinders found in the topes by Chev. VENTURA and M. COURT, and has there frequently a foot stroke, straight or curved, as in the 𐭯 above noted.

13. α, *p*? Whether this letter (α), which appears only on the latter coins of our series, in connections yet unread, be a mis-shapen variety of the *f*, is hard to say. It is precisely the *p* of the known Pehleví, and if inverted, forms the *m* of the same alphabet.

14. 𐭮 *s*. This letter rests on slight foundation; namely, the penultimate of AZILISOU 𐭥𐭮𐭉𐭋𐭠𐭮𐭥 *(aziliso)*. It is however very similar to the Arabico-Persic-Pehleví *s* on the Sassanian coins, given in the table of

alphabets in LICHTENSTEIN'S *Tentamen Palæographiæ Assyrio-persicæ.*

15. 𐭩 and 𐭠, *ā*. This letter has so strong a likeness to the Hebrew ע *ain*, that I have been tempted at once to assign to it the sound of broad *a*, without any positive example in any of the Greek names of princes to warrant it. Indeed, the *ain* being unknown in the Greek, it could not naturally express any member of that alphabet in the names of Greek princes, which may account for its absence there; but in the native words, its use is almost constant, and it frequently precedes 𐭯, forming the diphthong *āo* so prevalent in Zend words. It is moreover identical in form with the *a* of the sculptured Pehlevi inscriptions in Persia. No instance occurs of its beginning a word.

Several other letters are met with, for which counterparts in Greek cannot be so easily assigned. Some seem to be mere variations of form; but the knowledge of them will be essential before the writing on the cylinders can be decyphered.

16. 𐭦 seems to terminate words, and may therefore be equivalent to 𐭯. On the coin Pl. XX. No. 32, the combination 𐭫𐭩𐭤 occurs, which bears a strong resemblance to the word *malak*, as written in the ordinary form of Pehlevi; but if two languages were exhibited on one coin, the distinction would have been more marked.

17. 𐭭, in some cases seems a badly written 𐭣: in others it takes the place of ε, *n*; as in 𐭯𐭠𐭭𐭥 *minano*. In some examples it would be best explained as a vowel, as in the first syllable of *Eucratidou* .. 𐭭𐭲, also found written.... 𐭣𐭲; and both these forms approach that of the Pehlevi vowels *e* and *u*.

18. 𐭨. This letter may naturally be supposed to be a variation in writing of 𐭧, which I have imagined to be the letter *k*, or *d*, affected with the vowel mark *i*; but so many examples may be shewn in which they represent *t* or *ti*, that perhaps both forms should be properly given to that letter.

19. 𐭬. This letter constantly occurs on the *Pherrou* coins, and on them only. It may be the 𐭨 inverted; but as the form 𐭮 also occurs once on the coins, and very frequently on the cylinders, it can hardly be denied a distinct existence. I have no authority for its value.

20. 𐭧. This letter is found representing the Greek χ in *Antimachou*; it has a considerable likeness to the *ch* of the common Pehlevi.

21. 𐭪. The curve at the lower end of the second stroke of this letter alone distinguishes it from the 𐭤, or *p*; on the cylinders it generally has the curve : the tail is there extended below the line, and sometimes looped.

22. 𐭣, may be a variation of the supposed *s*, 𐭳; or it may be the *k* affected by a vowel mark : it is a common letter on the cylinders. Sometimes the hook is introduced on the opposite side of the stem, thus 𐭡, and this form may be a different vowel affection of the 𐭣 or *k*.

23. 𐨤. This mark, which wears rather the look of an ornament, is found on the coins having *Hercules* for the reverse, and only on them. I should not have included it among the letters, had it not so closely resembled the Arabico-Persic form of *a*, depicted in LICHTENSTEIN's table. He there states it to belong to the Sassanian coins, but I have not remarked it on any that I have examined, either in books or cabinets.

24. 𐨨. This letter may be a variety of 𐨀, or it may be a distinct letter. On the cylinders it has a tall stroke in the centre, 𐨨; taking the appearance of an inverted trident. I should have been inclined to pronounce it *zi* or *ji*, had I not already appropriated 𐨀 to this syllabic form.

I need not say that all the above explanations are open to correction; and I fully expect before the end of the year, that the learned members of the Asiatic Society of Paris, who have now before their eyes the coins whence most of my data have been derived, with all that I had ventured to *guess* upon them communicated by letter, will have developed the whole alphabet, with an accuracy not to be attained, except through a previous knowledge of the ancient languages of Parthia, and Ariana.

The only types of the Pehleví character, with which we can institute a comparison of the above alphabet, are those derived from the imperfectly decyphered coins of the Sassanian dynasty of Persian monarchs; and the inscriptions on the sculptures at *Nakshi-Rustam*, *Nakshi-Rajab*, and the *Takhti-bostán*. These are attributed to the same period, on the certain authority of the names of BABEC, his son ARDASHIR, and grandson SHAPUR, found not only in the Pehleví, but also in the Greek version, which fortunately accompanies some of the inscriptions. The BARON DE SACY, to whose *Memoires sur les Antiquités de Perse*, the learned world was indebted for the restoration of these valuable monuments of antiquity, was only able to deal with *one* form of the Pehleví, namely, that situated below the Greek (see KER PORTER, II. 552): for the inscriptions are generally trilingual; the version above the Greek being more rude than the other, and having a striking resemblance to the Chaldaic. KER PORTER transcribes one or two portions of the upper inscriptions in Hebrew; and informs us, that DE SACY always found this character had the same meaning as the Hebrew, when transcribed letter for letter. This author has given in Plate XV. vol. i. of his Travels, a fine facsimile in the two languages of the *Nakshi-Rustam* text, which had not been decyphered at the time of the publication of his work. A considerable portion of the members of our alphabet exist precisely in the right hand version of this transcript;

such as 𐎹, 𐎼, 𐎽, 𐎾, 𐎿, 𐏀, 𐏁, 𐏂, 𐏃, &c.: but for want of a perfect alphabet, or of a Roman version of the inscription, no comparison can yet be made. The learned LICHTENSTEIN, in his dissertation on the arrow-headed character, has furnished a plate of all the varieties of Pehlevi and Zend, as known in his time, from the travels of NIEBUHR, &c. By way of exhibiting the analogy which exists between these and our new character, I have carefully set them in comparison, in Plate XIX., taking LICHTENSTEIN'S imperfect alphabet of what he designates the *Arabico-Persic Zend*, as the only available one of this type. The *Pehlevi inscription* alphabet I have taken from KER PORTER'S facsimiles; and the *Pehlevi of coins* from plates of coins in MARSDEN, KER PORTER, HYDE, &c., and from actual coins: but in most of the latter that I have seen, the letters are so very indistinctly formed, that it is quite impossible to read them; and, indeed, most of the attempts hitherto made have failed to pass the common titles:—the names are very obscure. A reflection here forces itself, that if the coins of the Sassanian court were so illegible, we need not be surprised at equal or greater difficulties attending those of the Bactrian princes.

In the 6th column I have inserted, at random, such of the letters on the cylinders, as approach in appearance to the coin types. No reliance however must be placed on this allocation, until a reading has been effected of some portion. It is only intended to shew, that the characters of the cylinders and coins are identical in their nature.

In the last column I have added the Zend alphabet, as restored with so much ability by M. BURNOUF. It has a few points of accordance with the Pehlevi; but the genius of it follows rather the Sanscrit type; and the constant expression of the vowels, long and short, distinguishes it essentially from the alphabets of Semitic origin.

Having thus completed our survey of the characters found on the Bactrian coins, and on the curious inscriptions extracted from the topes, (in which latter however we must expect to find such deviations from kaligraphy as a written text naturally exhibits,) let us now apply our uncertain knowledge, with circumspection, to the various names and titles on the coins themselves, and see how they may be read in Roman characters.

Plate XX. contains them all arranged—first, according to the full inscriptions; secondly, the names and titles separated. From what has been said above, I would venture thus to express the names of the Greek sovereigns in Roman letters.

Apollodotou,.....	𐏁𐎠𐎺𐎹𐎴𐎹𐏁 *Apaladado*
Antilakidou,.....	𐏁𐎹𐎼𐎹𐎲𐎹𐎴 *Atikalikado.*
Antimachou,.....	𐏁𐎹𐎶𐎠𐏂 *Atimacho.*

Azou,..... 𐭠𐭩𐭥 *Ajo* or *Ayo.*
Azilisou,..... 𐭠𐭩𐭫𐭩𐭮𐭥 *Ajiliso.*
Eucratidou,..... 𐭩𐭥𐭪𐭫𐭠𐭲𐭩𐭣𐭥 *Eukratido.*
Ermaiou,..... 𐭠𐭫𐭥𐭩𐭥 *Ermayo.*
Menandrou,..... 𐭩𐭥𐭩 ש or 𐭩𐭥𐭥ש *Minano* or *Midano.*
Philoxenou,..... 𐭩𐭥𐭫𐭮𐭭 *Palatino* or *Palakino.*
Lysiou,..... 𐭩𐭫𐭫𐭮 or 𐭩𐭮𐭲𐭮 *Lisato,* or *Litato?*
Nônou..... 𐭩𐭥𐭪𐭫𐭮𐭭 *Ulalido?*
Unadpherrou,.... 𐭥𐭥𐭣𐭩 𐭩𐭮𐭫𐭪𐭮𐭩 *Fareto nanado?*

It must be confessed, that many of these are highly unsatisfactory, especially the last three. The name of KADPHISES is omitted, as being still more indistinct.

Turning now to the titles and epithets, it does not seem difficult to recognize the same appellation, for "king," and "king of kings," as is read on the sculptured inscriptions at *Nakshi-Rustam*, and on the Sassanian coins, 𐭫𐭠𐭪𐭮 *malako*, and 𐭫𐭠𐭪𐭮𐭲𐭠𐭪𐭮𐭫𐭠𐭪𐭮 *malakao-malako* (for *malakán-malaká)*. When another epithet is introduced, such as "*the great* king of kings," it is found interposed between the words *malakao* and *malako*, as 𐭫𐭠𐭪𐭮 𐭫𐭠𐭲𐭠𐭫𐭠𐭲 𐭲𐭠𐭪𐭮. The same form of expression exists in the Hebrew מלכארבא מלכא דאתור *rex maximus rex Assyriæ*. Every one will remark the close resemblance of this expression with our text; as well as of מלכאנמלכא, the Pehleví title of the Persian sculptures, with 𐭲𐭠𐭪𐭮𐭲𐭠𐭪𐭮𐭫𐭠𐭪𐭮 ; the terminations only being different, as might be expected in a different dialect. But, if the language of our coins be Zend, the word *melek*, for king, should not be expected in it: especially when we afterwards find it replaced by *rao* and *rao nano rao*, on the KANERKOS coins. It was this circumstance that led me to imagine the reading might be *maharáo ;* but the combination *maháraomaharó* is inadmissible, and overthrows the conjecture.

Pass we now on to the next title of most common occurrence, 𐭫𐭩𐭫𐭪, or 𐭫𐭩𐭩𐭪, ΣΩΤΗΡΟΣ, the Saviour. By our system this must be rendered either *rakako, radako,* or *radado*. Now the first of these three forms is precisely what might be expected to be the Zend reading of the Sanscrit word रक्षक, *raksaka*, Saviour, and that alone is a strong argument in favor of its adoption as the true reading of the term.

The title ΜΕΓΑΛΟΥ ΒΑΣΙΛΕΩΣ, first, we are told, assumed by EUCRATIDES, belongs to so many of his successors, that we have no difficulty in finding the exact version of the term in the Pehleví. There are, however, decidedly two readings of it; one 𐭫𐭩𐭫𐭩𐭫𐭠𐭲, the other 𐭫𐭩𐭫𐭠𐭲, with the omission of the duplicated letter in the centre. The obvious rendering of these two expressions would be *kák-káo* and *kákáo*. But I find in M. BURNOUF's *Commentaire*, that the Zend word for "great," is *maz*, from the Sanscrit *mahá*, to which our term has no

resemblance whatever. It has most similarity to the Tartar appellation *khákán*, common to monarchs of Bactria in later days; and it may not be unreasonable to assume this reading, until one more plausible is discovered. At first I was inclined to read it *ra-rao*, in conjunction with the preceding word *maharáo*, on the strength of the expression before alluded to, of *rao nano rao*, on the Kanerkos coins; but in no example have I found the first letter ר replaced by ש. The collocation of the letters is, again, exactly similar to those of the Hebrew רברבא *rabreba*, maximus; but for this reading we must suppose 𐨁 to be a *b*, which is contradicted by all other examples.

For ANIKHTOY, the unconquered, we find the terms 𐨀𐨗𐨫𐨪𐨿 *ápatilo*, and 𐨀𐨗𐨫𐨪𐨫𐨿 *apatiláko*; and for NIKHΦOPOY, the conquest-bearing, 𐨀𐨗𐨤𐨿, *ájalako* or *ájalado*; of neither of these can I attempt a solution, and the examples being few, we can not be very certain of their correctness.

The inscription cut on the silver disc found in the casket of the Manikyála Tope, (Vol. iii. Pl. XXII. fig. 26,) may be read 𐨐𐨫𐨯𐨪𐨐𐨫𐨪𐨐 *famaro kanadako*; the second word without any very great straining might be conceived to be the native mode of writing *Kanerko*; and if this interpretation be allowed, we may indeed look upon this tope as the monument of that monarch.

The writing on the brass cylinder itself (*fig.* 20 *b* of the same plate), which was from my ignorance inverted in the engraving, seems to consist of the following Bactro-Pehleví characters 𐨑𐨪 𐨐𐨫𐨪𐨐𐨫𐨪𐨐𐨫𐨯𐨿, which in Roman letters would be *kad·· malapo, far· kamana papako*, the purport of which I must leave uninterpreted: nor will I endeavour to forestal the ingenuity of others, by any crude attempt to convert into Roman letters the longer inscriptions given by Mr. MASSON, from the Jelálabád cylinder, (Vol. iii. Pl. XXII.), and by M. COURT, from the stone slab of another Manikyála tope (Vol. iii. Pl. XXXIII.). I have already remarked, that this latter inscription contains, very legibly, in the second line, the word 𐨟𐨗𐨪𐨯𐨿 *malakáo*, identical with the royal designation so common upon the coins.

It is now indeed time to turn our attention to the coins themselves, whence our data for the construction of the Bactro-Pehleví alphabet have been derived. Of these I need do little more than furnish a few notes of reference to the accompanying six plates, in which I have brought down the series of selected specimens from Euthydemus to *Kadaphes Choranos*, a name so nearly allied to *Kadphises*, that the latter may be looked upon as its patronymic; while the title that follows it (*Choranos*) coincides so closely with what has been already described as existing on the *rao nano rao* group (vol. iii. p. 448), that it would seem to form the link of connection between them and the coins which bear Pehleví legends on the reverse.

Coins with Greek inscriptions only.

With EUTHYDEMUS of Magnesia, who conquered THEODOTUS II, B.C. 220, commences our present series: of his coinage I now possess a medal in silver, procured by MOHAN LÁL, for Dr. GERARD, near Kábul. It is superior in execution to the fine coin taken home by Lieut. BURNES. The exterior surface is of a dark-grey, like that of chloride of silver.

Pl. XXV. *fig.* 1.—EUTHYDEMUS, silver tetradrachma, weight 240 grs.

Obverse. Head of the king in high relief.

Reverse. HERCULES with his club, seated on clouds; inscription ΒΑΣΙΛΕΩΣ ΕΥΘΥΔΗΜΟΥ.

Fig. 2.—A hemidrachma of DEMETRIUS, silver, in the Ventura collection; a very beautiful coin, similar to one depicted in Sestini.

Obverse. Head of the king, with helmet shaped like an elephant's skin and tusks.

Reverse. HERCULES standing, inscription ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ.

AGATHOCLES.

Fig. 3.—A silver coin of AGATHOCLES, in the Ventura collection.

Obverse. A well-executed head, with the royal fillet: short curly hair.

Reverse. Jupiter standing, holding a small female figure, having apparently a flambeau in either hand: on the sides ΒΑΣΙΛΕΩΣ ΑΓΑΘΟΚΛΕΟΥΣ, with a peculiar monogram.

The general appearance of the head, and of the figure on the reverse, resemble the unique coin of HELIOCLES which Mr. WILSON has sketched for me from VISCONTI's work. Should there have been any indistinctness in the first two letters of the name on that coin, we may find reason to erase HELIOCLES from the Bactrian monarchy, and to substitute AGATHOCLES, of whom Mr. MASSON has already made known to us ten very peculiar copper coins, (Jour. III. Pl. ix. fig. 17.) The inscription in Pehleví (?) on the reverse of those coins proves that they belong to a Bactrian prince, and are not to be ascribed to ALEXANDER's general of the same name, who is no where asserted to have assumed the regal power. The name is common enough. It was in revenge for a grievous insult offered to his family by one AGATHOCLES, prefect of the provinces beyond the Euphrates, under ANTIOCHUS THEOS, (B. C. 250,) that the Scythian ARSACES was roused to establish independent dominion in Parthia. The same party may have followed the example of assuming the title of king in some province of Bactria. That the coin does not belong to AGATHOCLES of Syracuse I can now assert with confidence, having before me the most beautiful plates of the coins of that sovereign, (whose name is always written in the Doric genitive *Agathocleos*, or *Agathocleios*,) in the 'Tresor de Numismatique', now under publication at Paris*.

* I discover in the same plate that the Greek coin (*obverse*, Minerva, and *reverse* Pegasus), described by me in the second vol. of this Journal (Pl. I. fig. 2) belongs

MAYUS.

Fig. 4.—One of two copper coins of MAYUS, or NAYUS? in the Ventura collection.

Obverse. Head of an elephant, with proboscis elevated; a bell hanging round the neck.

Reverse. The Caduceus of Mercury, on the sides of which the words BAΣIΛEΩΣ MAΓOY, and a monogram composed of the letters M and I.

This is an entirely new name, nor can it be read as a Greek word in its present shape, although the characters are perfectly distinct on the coin, and the style of engraving corresponds with the early and pure Greek types. There is no Pehlevi inscription. Could the third letter be read as a *gamma*, the name MAΓOY might denote the union of the office of chief priest of the *Magi* with that of king, and the elephant's head found on the coins of MENANDER and of DEMETRIUS, might enable us to appropriate the present medal to one or the other of these princes.

EUCRATIDES.

Figs. 5 to 10.—Coins of EUCRATIDES the Great.

Fig. 5.—A silver tetradrachma, badly executed. Ventura.

Obverse. Head of the king, helmeted.

Reverse. Two Bactrian horsemen, (or Castor and Pollux,) with wings on their shoulders, and lances; the two first letters of the legend corrupt, PVΣIAEΩΣ MEΓAΛOY EYKPATΔOY; monogram M.

Fig. 6.—A beautiful didrachma, of the same prince. Ventura.

Obverse. A neat head, without helmet; hair bound with fillet.

Reverse. Two horsemen; inscription BAΣIAEΩΣ EYKPATIΔOY.

Fig. 7.—A very well preserved copper coin of the same prince, presented to me by Captain C. M. WADE.

Figs. 8, 9, and 10.—Three copper square coins of the same prince, upon the reverse of which is seen, for the first time, the introduction of a Pehlevi legend. Several of the same coins are depicted in Mr. MASSON's paper; they all agree in having the inscription on three sides only of the square; the Pehlevi letters are as follows: צורצך לצורצך יכהלידיך The plates will shew the variation to which the letters of the name are liable; in Roman characters they may be rendered *malakao kákáo eukratido*.

The history of EUCRATIDES is too well known to require repetition here†. BAYER fixes his ascent to the Bactrian throne in the year

to HIERON II. of Syracuse, 270—216 A. C. The coins in this new and splendid monument of art are all engraved by the medal-ruler invented by BATE, from originals in the museum of Paris, and other great collections.

† See Journ. Vol. II. 409, and Maurice's Modern Hindostan, I. 98.

181 B. C. He was a cotemporary of MITHRIDATES I. of Parthia, who assisted him in repelling DEMETRIUS, king of *India*, as he is termed, beyond the Indian frontier, and finally driving him from his throne at the advanced age of 78 years. On the division of the conquered empire, MITHRIDATES had the provinces between the Hydaspes and Indus assigned to him; and EUCRATIDES, all the remainder, east and south, of his Indian possessions:—'*all India*' is the term used, but it is uncertain to what limit southward this expression should apply.

It has not yet been remarked by those who are curious in reconciling the names of Indian legend and Grecian history, that the names EUCRATIDES and VICRAMÁDITYA bear a close resemblance both in sound and in signification: while the epoch and the scene of their martial exploits are nearly identical. The Hindu accounts of VICRAMÁDITYA are not to be found in the regular Puránic histories, but only in separate legends, such as the *Vicrama Cheritra* and others, mentioned by WILFORD, (As. Res. IX. 117,) all teeming with confusion, contradictions, and absurdities in an extraordinary degree. The genealogical tables of the solar and lunar lines contain no such name, neither does it occur among the few notices of embassies to and from India to Syria and Rome, in the authors of the west‡. EUCRATIDES' empire was so extended and matured that he assumed the title of *βασιλευς μεγαλος*: thus the peaceful coin, *fig.* 6, was doubtless struck before his expeditions; those with the armed head, and the addition of "the great," after his return: and it is remarkable that the latter only have a Pehleví legend on the reverse, being intended for circulation perhaps in his more southern provinces, or imitating in this respect the coins of MENANDER, whose reign in India had been so glorious. If the date assigned by BAYER (146 B. C.) to *Eucratides'* death, be thought too far removed from the commencement of the *Samvat* era of VICRAMA'DITYA (56 B. C.), it may be argued, that as EUCRATIDES is acknowledged to be the last but one of the regular Bactrian kings, all the new names recently discovered—AGATHOCLES, MAYUS, PHILOXENUS, ANTIMACHUS, &c. must find their places before him in the list, which may easily bring down his date even a century.

The analogy between the Bactrian and the Indian heroes is, it must be confessed, of very slender texture, just enough to be hazarded as a web of speculation, which more skilful antiquarians may indulge their ingenuity in spinning out, or brushing aside as visionary.

‡ The embassy of "PORUS" to AUGUSTUS must have been immediately after VICRAMA'DITYA.—It is stated that his letters were written in the *Greek character*. The Scythians were then pressing the country.

KODUS.

Figs. 11, 12, 13.—Three small silver coins, inserted in this plate, because their inscriptions are entirely Greek, though they have no other pretension to be counted with Bactrian coins. The appearance of the head-dress in the third is rather Arsacidan, but the names and titles are altogether novel and curious. I have selected the three most legible from among several coins in my possession. The first two are of MOHAN LA'L'S, the third of KERÁMAT ALI'S, collection. The name of ΚΩΔΟΣ is altogether unknown.

The heads on the *obverse* of all these coins seem to belong to different persons; the standing warrior on the reverse is alike in all, and the inscriptions on the two first ΚΩΔΟΥ ΜΑΚΑΡ ..... ΡΑΘΟΡΟΥ. On the third coin, the titles differ, and are illegible, but the name ΚΩΔ.... is the same.

Plate XXVI. MENANDER.

Although MENANDER is well known to have preceded EUCRATIDES in date, I have preferred separating his coins from the genuine Bactrian group, and classifying them with those of APOLLODOTUS, ANTILAKIDES, &c., as a distinct series, on account of the essential difference in their style of execution. Their native legends, also, seem to denote a different locality. MENANDER, before he came to the throne of Bactria proper, had, it is supposed, formed an independent dominion in the more southern provinces on the Indus. This may be the reason of the deviation from the Syrian type of coin, so remarkably preserved by the earlier sovereigns of Bactria.

Figures 1, 2, 3, one silver and two copper coins of MENANDER.

Fig. 1.—A silver hemidrachma, weighing 37 grains, (one from KERAMAT ALI; a duplicate from Dr. GERARD,) differing from those depicted in MASSON'S plates, and from Dr. SWINEY'S coin described in the Journal, vol. II. p. 406.

Obverse. Head facing the left, on the margin ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΜΕΝΑΝΔΡΟΥ: a kind of sceptre, or crook, lying on the shoulder.

Reverse. Minerva with Jupiter's thunderbolt, facing the right; Pehlevi legend 𐭬𐭩𐭮 𐭫𐭥𐭪𐭩𐭬 𐭫𐭥𐭪𐭥𐭪 𐭬𐭭𐭭𐭥, *malakáo rakako minano*, and monogram (see vol. III. page 164.)

Fig. 2.—Has already been drawn and described by Mr. MASSON. Vol. II. (ç)

Fig. 3.—Differs from MASSON'S *fig.* 1, in the figure of Victory on the reverse. (K.A.)

APOLLODOTUS.

Figures 4, 5. Two silver coins of APOLLODOTUS, both in the Ventura cabinet; of the first the number is considerable, the latter is new, and of very beautiful execution.

Fig. 4.—Has already been described from Dr. SWINEY'S coin in JOURNAL, vol. ii. page 406. The legend on the *obverse* is here quite distinct ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΚΑΙ ΦΙΛΟΠΑΤΟΡΟΣ ΑΠΟΛΛΟΔΟΤΟΥ. The Pehlevi inscription on the *reverse*, however, has no addition for the words *και φιλοπατορος*, being simply 𐭬𐭩𐭮 𐭫𐭥𐭪𐭩𐭬 𐭫𐭥𐭪𐭥𐭪 𐭬𐭭𐭭𐭥.

Fig. 5.—Has on the *obverse*, the Indian elephant, with a monogram, and the usual title; and on the *reverse*, a *Brahmany* bull, with the same Pehleví legend.

Fig. 6.—Is a copper coin in Dr. SWINEY's collection, the precise fellow to that described by Major TOD, in the Royal Asiatic Society's Transactions.

Figs. 7, 8.—Are two from among several square copper coins brought down by MOHAN LA'L. They are nearly the same as the coin in Lieut. BURNES' collection, (J. A. S. vol. ii. pl. xi. fig. 7,) which, I then supposed to be a MENANDER, but which I am now able to recognize by its Pehleví legend. The examples on these coins, are decisive of the orthography of 𐭮𐭥𐭫𐭩𐭪 (Soteros.)

ANTILAKIDES.

Figures 9, 10, 11, are three selected quadrangular coins of ANTILAKIDES, from six in the Ventura collection. The name was first made known by MASSON, who supposes from the beards, (which are not however so clear on the specimens before us,) that this prince and the next ΑΤΣΙΟΣ belong to a separate dynasty. He detects the conical emblem of the reverse on one coin of EUCRATIDES. I have not however found any of the sort. One description will serve for all.

Obverse. Head of the sovereign, with the legend ΒΑΣΙΛΕΩΣ ΝΙΚΗΦΟΡΟΥ ΑΝΤΙΛΑΚΙΔΟΥ.

Reverse. Two plumes waving over two conical caps or bee-hives? Monogram below 𐭠𐭣, and Pehlevi inscription 𐭠𐭫𐭠𐭭𐭫𐭩𐭪 𐭩𐭫𐭥𐭠𐭩 𐭩𐭫𐭥𐭠𐭮𐭩𐭪, *or malakáo ajalado atílikado*, or *átikalikado?*

LYSIUS.

Fig. 12.—A copper quadrangular coin of LYSIUS, similar to two in Masson's series of AUSIUS:—the first letter is clearly an *l*, in Greek, and this reading is confirmed by the Pehleví 𐭫. The monograms are the same as in the last coin.

Obverse. Head of the king with the legend ΒΑΣΙΛΕΩΣ ΑΝΙΚΗΤΟΥ ΛΤΣΙΟΥ.

Reverse. An elephant with a monogram 𐭠𐭣, and the Pehleví inscription 𐭪𐭠𐭩𐭫..... 𐭪𐭥𐭫𐭥𐭮𐭩 *malakáo ..... lisato.*

Plate XXI.

I have designed in this plate from the Ventura collection several very interesting coins, of new names and features, for which no locality can as yet be assigned. As almost all of them bear Pehleví inscriptions, they are evidently Bactrian; but to admit them in the regular series of that dynasty, would greatly extend the catalogue of its princes. They rather bear out the fact of there having been several petty independent dynasties, like that at Nysa, for which Mr. MASSON endeavours to set apart some of the coins to be presently mentioned.

PHILOXENUS.

Fig. 1.—A fine silver coin of PHILOXENUS in the Ventura collection. This name was borne by one of ALEXANDER's generals, to whom Cilicia, *west* of the Euphrates, was assigned in the division of his conquests. The coin, therefore, cannot belong to him, though his title of 'unconquered' would argue his power and warlike propensity.

Obverse. Head of the prince, in a helmet similar to that of EUCRATIDES, legend, BAΣIΛEΩΣ ANIKHTOY ΦIΛOΞENOY.

Reverse. The prince on horseback; monogram formed of two Λ's: legend in Pehlevi 𐭯𐭠𐭣𐭥 𐭯𐭣𐭩𐭭 𐭯𐭣𐭥𐭮.

Fig. 2.—A square copper coin of the same prince, nearly allied to those of the last plate.

Obverse. A female figure holding the cornucopia. Greek legend, and monogram as before.

Reverse. The Brahmany bull, with the same Pehlevi legend, and the letter 𐭣 as a monogram.

ANTIMACHUS.

Fig. 3.—A small silver coin of ANTIMACHUS, also a new prince. The character of the horseman connects it with the preceding; the portrait of the prince is wanting, nor can I find any record of his name preserved.

Obverse. Victory or Fame: legend BAΣIΛEΩΣ NIKHΦOPOY ANTIMAXOY.

Reverse. Horseman, and Pehlevi inscription 𐭯𐭮𐭢𐭭 𐭯𐭣𐭥𐭠 𐭯𐭩𐭣𐭥.

Fig. 4.—A copper coin recognized to belong to ANTIMACHUS, from the Pehlevi name. Vent.

NONUS.

Fig. 5.—A silver coin of NONUS, in the same style as the last, and without portrait. Vent.

Obverse. Horseman, with couched lance; scarf round the neck, part of the legend visible BAΣIΛEΩΣ ..... NΩNOY.

Reverse. Soldier holding a spear; name in Pehlevi, 𐭯𐭣𐭥𐭠𐭣. .....

Fig. 10.—A square copper coin of the same prince, in which his title of *μεγαλου*, is apparent. The style of the copper coinage compared with the silver, in all the above, connects them with the MENANDER and APOLLODOTUS group.

Uncertain names.

Fig. 6.—The same as MASSON'S No. 44. The name is not visible in the Greek, and if restored from the *Pehlevi*, which is quite distinct, it is unintelligible, ULITIZOU: the titles are of a paramount sovereign: the Greek letters corrupted.

Obverse. The king holding a sceptre BAΣIΛEШΣ BAΣIΛEШN MEГAΛOY.

Reverse. Jupiter seated in his chair. Pehlevi inscription 𐭯𐭩𐭣𐭠𐭣 𐭯𐭣𐭥𐭮 𐭯𐭮𐭥𐭮.

Figs. 7, 8.—The grandiloquent titles in these are the same as the last, and both, perhaps, on that account should be classed with the AZOS series, in the next two plates, which has invariably the title "the great king of kings."

Fig. 9.—This square copper coin has the precise style of the NONUS and the AZILISOS device.

Obverse. A horseman with couched lance: letters visible of the legend BAΣIΛEΩΣ NIKATOPOY AΔEΛΦOPOY ?

Reverse. A seated figure, probably Hercules. Pehlevi legend, though sharply cut, not intelligible 𐭧𐭩 𐭯.𐭩𐭣𐭥𐭠𐭣.

Fig. 11.—The title 'King of Kings' is also visible on this coin, with the emblem of an elephant on the obverse. The king, seated on a couch, is placed on the reverse. No native legend is traceable.

Figs. 12, 13, 14,—belong to a series of coins *sui generis*: the two first are of the Ventura collection, the third from MASSON'S plates. The head fills the *obverse*, while the title in corrupt Greek surrounds a well executed horse on the *reverse*. It is probable that all the horse coins belong to one locality: Bactria was famous for its fine breed of this noble animal; but he is generally represented mounted by a warrior. This coin, and No. 8, are the only ones on which he appears naked. The extended arm of the prince on the obverse is a point of agreement with the common coin, fig. 25 of Pl. XXIII.

Plates XXII., XXIII. Azos.

We now come to a series of coins exceedingly numerous, and of various device, bearing the name of a prince altogether unknown to history. It was from a coin presented by Munshi MOHAN LÁL, (Dr. GERARD'S companion de voyage,) to Dr. J. GRANT, that I first recognized the name of this sovereign, many of whose coins had passed through my hands before in Lieutenant BURNES' collection, and in MASSON'S plates, without presenting a legend sufficiently distinct to be decyphered. General VENTURA'S collection also possessed many very distinct coins of Azos, and his name either in Greek or in Pehlevi was thence traced through a series of coins that had been given to other monarchs.

The title of Azos is always ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΑΖΟΥ. In Pehlevi 𐭠𐭋𐭩 𐭥𐭥𐭫𐭪 𐭥𐭥𐭫𐭪 𐭥𐭥𐭫𐭪 *malakáo, kakkáo, maláko, Ajo,* or *Ayo.* The name is generally set upright under the device both in Greek and Pehleví; but an occasional exception occurs, as in *fig.* 12, where it runs continuously with the rest of the marginal legend. None of the coins of Azos bear his head, nor in general have they his effigy, unless the seated figure in *figs.* 12 and 13, represent him, as is probably the case, seated on a cushioned throne, with a sceptre on his lap. The mode of sitting, it should be remarked, is entirely oriental, and the animals depicted are such as belong peculiarly to the East, the elephant, the Brahmany bull, the lion, and the Bactrian camel. The cyphers or symbols on the reverse of these coins seem evidently compounded of Pehleví letters, on the same principle as those of the more genuine Greek coins, from Greek letters; they may probably denote dates, but it will require much labour to establish this point, and the same symbol appearing on coins of very different devices, as on *figs.* 2 and 11, rather militates against the supposition.

It is a peculiarity of the coinage of this period, that the pieces were of a very debased metal, washed over with silver somewhat in the manner of the coins of the Roman Emperor GALLIENUS and his successors, and denominated "billion" by numismatologists. Is it possible that the scarcity of silver to which the origin of this species of coin has been attributed in the West, had extended even to India?

if so, it will fix the date to the latter half of the third century. At any rate, it is fair to suppose that the system was copied from the Roman coins, to which many other circumstances of imitation may be traced; among these, the soldier trampling on his vanquished foe in *fig.* 14; and the radiated head of *fig.* 26, the coin without a name, which is connected with the rest of the series by the equestrian reverse, seems an imitation of the radiated crown of the Roman emperors of the same period.

Plate XXII. *figs.* 1, 2, 3.—Three coins of Azos, having on the *obverse*, a Brahmany bull, and on the *reverse*, a panther or lion. The monograms on all three differ: legends in Greek and Pehlevi as above described.

Figs. 4, 5.—On these the bull is placed with the Pehlevi on the *reverse*, while a well-formed elephant occupies the place of honor on the obverse.

Figs. 6, 7, 8.—In these the place of the elephant is taken by a Bactrian camel of two humps. No name is visible on any, but the Pehlevi word אזרק is plain on No. 8, and their general appearance allows us to class them with the foregoing coins of Azos.

Fig. 9.—Here a horseman, with couched spear, in a square or frame, occupies the *obverse*, and the bull again the *reverse:* the word *Azou* is distinct on both sides. The device and attitude of the horseman will be seen to link this series with the coins of *Nonos*, *Azilisos*, and others, that are as yet nameless.

Figs. 10, 11.—A figure seated on a chair, holding a cornucopia, marks the *obverse* of this variety; while on the *reverse*, we perceive a Hercules or Mercury. It was from fig. 11, (a coin presented by MOHAN LA'L to Dr. GRANT,) that I first discovered the name AZOY, afterwards traceable on so many others.

Figs. 12, 13.—The *obverse* of this variety affords important information, in the attitude of the seated prince. It plainly proves him to be oriental.

The scarf on the erect figure of the *reverse* is also peculiar. This coin accords with one depicted in the Manikyála plate, vol. iii. pl. xxvi. fig. 2.

Plate XXIII. *fig.* 14.—Is one of six coins in the Ventura cabinet of the same type. The soldier trampling on a prostrate foe betokens some victory. The female figure on the *reverse*, enveloped in flowers, seems to point to some mythological metamorphosis. The name and titles are distinct.

Figs. 15, 16, 17, 18, 19, 20, 21.—Are all closely allied, while they serve to explain figs. 11, 12, and 15, in the plate of Lieut. BURNES' coins, (J. A. S. vol. ii. p. 314,) and figs. 30, 31, 32, 33, 45, of MASSON'S fourth series, vol. iii. pl. x. They are for the most part of copper-plated, or billion, and in consequence well preserved; the single Pehlevi letters ך, ל, א, and ק may be observed as monograms, besides the usual compounds. On 21 and 22, are the first indications of a fire altar.

Fig. 22.—This copper coin is the last on which the name Azos occurs, and although quite distinct in the Pehlevi, it is corrupt and illegible in the Greek. The device is similar to the preceding, with exception of a curious circular monogram, which will be found also on the coins of *Kadaphes* hereafter. MASSON'S fig. 47, is the same coin.

Fig. 23.—A very deeply cut coin, commences a new series, in which, the form of the Greek letters is materially changed. The legend is now

BACIΛЄVC BACIΛЄѠN CѠTHP MEГAC, without the insertion of any name*; and the monogram is the one frequently described as the key symbol, or the trident with a ring below it.

In Pehleví the first portion corresponds with the Greek, טורק רבורק טורק; the conclusion is unfortunately not visible. The letter ה appears on the field of the *reverse*, which bears a portrait of a priest, extending his hand over a small fire-altar.

Figs. 24 and 25—May be safely called varieties of the above, still retaining the Pehleví on the reverse. A counterpart of fig. 24 will be found in fig. 15 of BURNES' collection.

Fig. 26.—This is by far the most common coin discovered in the Panjáb and Afghanistán. Bags full have been sent down in excellent preservation, and yet nothing can be elicited from them. The present specimen is engraved from a coin in Colonel STACY'S cabinet, found in Malwa; but the same coin has been engraved in the As. Res. vol. xvii.; in BURNES' collection, fig. 13; also, 10 of pl. xiv., in the same volume: and in MASSON'S series, 26, 27, 28. It was the first coin found in India on which Greek characters were discovered, or noticed. The trident monogram connects it with the foregoing series; but it is impossible to say to whom they both belong. I have placed them next to Azos, from the similarity of the horseman. They are all copper coins, of high relief, and generally in good preservation.

AZILISUS.

Figs. 27, 28.—Were it not that the name in these two coins is distinctly AZIAIΣOY in the Greek, and יזילסס in the Pehleví, they might both have been classed in the preceding group, especially with *fig.* 9. The bull of *fig.* 28, is surmounted by two monograms, like those of the *Lysius* coins. It is so far singular, that while the name of the prince AZILISUS seems compounded of the two names *Azos* and *Lysius*, the *obverse* and *reverse* of his coins should be counterparts of theirs. The name itself is quite new, and we can only venture to assign his position in proximity to his prototype, Azos.

Plate XXIV. HERMÆUS.

Figs. 1, 2, 3, 4. One silver and three copper coins of HERMÆUS, selected from a considerable number in order to develop the whole circle of marginal inscription, seldom complete on a single specimen. The description of one will serve for all, since, contrary to usage, the impression on the silver and copper is precisely alike.

Fig. 1.—A silver coin in the Gerard collection.

Obverse. The king's head with simple diadem; legend in corrupted Greek BAΣIΛEΩΣ ΣΩTHГ□Σ EГMAI□V.

* Mr. MASSON attributed this series to a prince, whom he named *Sotereagas*.

Reverse. Jupiter seated; his right hand extended. Monogram 𐨪; Pehlevi legend 𐨐𐨁𐨯𐨬𐨭 𐨐𐨁𐨭𐨭𐨐 𐨐𐨁𐨪𐨭𐨯, *malakáo rakako Ermayo.*

Mr. MASSON supposes HERMÆUS I. to have reigned at Nysa (hod. *Jelalabad,)* because one of the topes opened in that neighbourhood contained several of his coins; they have, however, been found in equal abundance in the Panjáb, and it will be safer in the present paucity of our knowledge to adhere to the general term "Bactrian," without attempting to subdivide the Greek dominion into the separate states, of which it probably consisted throughout the whole period of their rule.

UNADPHERRUS.

Figs. 5, 6, 7, 8.—Four coins of the prince made known to us by Mr. MASSON under the name of UNADPHERRUS. They are numerous, of rude fabric, and more clear on the Pehlevi than the Greek side. The device on all is the same, namely:

Obverse. A bearded head with diadem: inscription as made out from the combined specimens BAϹIAEΩϹ ϹΩTHΓ□Ϲ VNA□ΦЄΓΓ□V:—in some the titles are in the nominative case.

Reverse. A winged figure of Victory holding out a chaplet or bow: Pehlevi inscription 𐨐𐨁𐨯𐨬𐨭 𐨐𐨁𐨣𐨣𐨣 𐨐𐨁𐨪𐨭𐨯.

This may be rendered *malakáo fareto nanado;* or the last word may be 𐨪𐨭𐨯𐨐 for *σωτηρος.* If 𐨣 be *p* and 𐨬 *h*, we might convert the word letter for letter into *phero*; making 𐨁 an *r*. The first half of the name VNA□ or VNAΔ seems to be omitted in the Pehlevi, unless *nanado* be intended for it; but then the title 'Saviour' will be wanting.

The only recorded name that at all approaches to this barbarous appellation is *Phraotes* or *Phrahates,* whom PHILOSTRATUS asserts to have reigned at Taxiles, south of the Indus, about the commencement of the Christian era. He was visited by APOLLONIUS TYANÆUS in his travels, who conversed with him in the Greek language. The execution of the coins before us, does not well agree with the magnificence and elegance of PHRAOTES' court, as described by PHILOSTRATUS, "the residence of dignified virtue and sublime philosophy*;" but much allowance may be made for exaggeration. The Bactrian sway was already broken, and the country in a disturbed state. "Whether Parthian or Indian, PHRAOTES was tributary to the Southern Scythians, whom he gladly subsidized to defend him against the more savage Huns, who finally drove before them the Scythians, who had seized upon the Bactrian kingdom†." APOLLONIUS describes a magnificent temple of the sun at Taxiles. The fact, frequently mentioned in history, of the native princes of *India* conversing and

* Maurice's Modern Hindostan, I. 152. † Ditto, I., 142.

writing in Greek, is satisfactorily confirmed by the discovery of the present coins bearing Greek legends with names evidently native.

Figs. 9, 10, 11, 12, 13.—This very numerous group of copper coins is attributed by MASSON to ERMÆUS the Second, the first three letters of whose name certainly appear on some few specimens (as *fig.* 10); but his name is not to be found on the reverse in the Pehleví, which is totally distinct from the preceding coins, and yet it is the same on all the specimens I have compared; although great variety exists in the Greek legends, as if they had been copied at random from other coins. The device of all is the same.

Obverse. A head with curly hair, no beard, in general miserably engraved. For marginal inscription; *Fig.* 9. has ....ΛΕΩΣΣΤΗΡΟΣ ΣΤΛ□.....

Fig. 10, ΒΛΣΙΛΕ....ΕΓΜ...

Fig. 11.—....NO ΚΑΔΦΙCΗC and *fig.* 12, ΒΑCΙΛΕΩΣ.....Ε□Υ.

Reverse. A spirited figure of HERCULES, standing with his club, and lion-skin cloak. Pehleví inscription, as well as it can be made out from a careful examination of a great many specimens, 𐭤𐭩𐭮𐭫𐭠𐭯𐭲𐭰 𐭯 𐭩𐭧𐭤𐭣𐭥 𐭫𐭪𐭧𐭱𐭥.

This text differs so entirely from all we have hitherto seen, that I cannot attempt to decypher it, nor even to distinguish the titles from the name. I have merely placed ∪ at the head, from a faint trace of the initial word 𐭤𐭤𐭫𐭥, between the letters of which other characters appear to be introduced. The decided trace of KADPHISES' name on several coins of the type, incline me to place it at the lowest station in the present series, as a link with the series already fully described of that Indo-Scythic sovereign: and it will be remarked that the letter or symbol 𐭧 is visible on the *bull and raja* coins of this prince also; indeed their whole Pehleví inscription much resembles, if it does not coincide entirely with, the present example.

KADAPHES.

Figs. 14, 15, 16.—If any thing were wanting, however, to connect the two lines, these coins would supply the gap. One of them was presented by Lieut. BURNES to the Society, and was mistaken for the horseman coin described in page 343. The name was more fully made out from six coins of VENTURA's and three of KERAMAT ALI's collections. The monogram agrees with one of the Azos series, fig. 22, as before remarked.

Obverse. A neatly engraved head with diadem and legend..... ΚΑΔΑΦΕΣ ΧΟΡΑΝΟΥ.

Reverse. Jupiter seated, left hand extended; the wheel monogram, and legend in nearly the same characters as that of the preceding coins.

This coin will form an appropriate conclusion to my present notice, which, I believe, has embraced all the specimens properly attributable to the Bactrian group. The fire-altar on the next or Indo-Scythic coinage, forms a convenient mark of distinction, as well as the

disuse of the Pehleví character, which extends no further than to the first coinage of the series, namely, that of KADPHISES, with the bull reverse ; and is quite illegible there, while the Greek is comparatively distinct. This group has, however, been sufficiently described in my former papers.

Before closing my present notice, I must use my privilege of amending the theory I advanced upon one of the coins from the Manikyála tope, (Vol. III, *Pl.* XXV, *fig.* 6, p. 441,) a Sassanian coin bearing the distinct Sanscrit name of *Sri Vásu Deva*. This being the patronymic of KRISHNA, I supposed the figure to represent that god as the Indian substitute for Mithra or HAIOΣ. The face, however, was that of an aged human being, and I think it may be more rationally accounted for as such, on the following grounds.

Ferishta asserts that BASDEO had assumed the throne of Canouj in the year 330, A. D.; that BAHRAM the Persian king, was at his court in disguise, and was recognized by the nobleman who had taken *tribute to Persia* from the Indian king*. BASDEO reigned 80 years, and one of his daughters was married to BAHRAM. Now under these circumstances, it is natural to suppose, that the Sassanian monarch, out of compliment, may have affixed his father-in-law's portrait and name on some of his own coin: and the strongest evidence is thus afforded both of the historical fact, and of the date of this individual coin of the Manikyála set.

Proceedings of the Asiatic Society.

Wednesday Evening, July 1, 1835.

The Honorable Sir EDWARD RYAN, President, in the chair.

The Proceedings of the last Meeting were read.

The following gentlemen, Messrs. J. P. GRANT, WM. ADAM, W. H. BENSON, GEORGE EVANS, Lieut. A. S. PHAYRE, Mr. J. H. STOQUELER, Capt. J. G. TAYLOR, Mad. Cav. and Lieut. MONTRIOU, I. N. proposed at the last meeting, were balloted for, and duly elected members of the Society.

The Secretary read the following reply from Government to the memorial presented, in conformity with the resolution of the last meeting.

To the Honorable Sir EDWARD RYAN, Knt.

Genl. Dept. *President of the Asiatic Society.*

HONORABLE SIR,

I have the honor to acknowledge the receipt of an address, dated 3rd instant, transmitted by you to the Governor General in Council, on behalf of the Asiatic Society.

2. I am directed in reply to forward to you a copy of orders issued by the Supreme Government, on the 7th March, to the Committee of Public Instruction, which will make the Society acquainted with the views and

* Maurice, I., 150.

intentions of the Government, on the general question discussed in your address.

3. With respect to the specific requests and recommendations contained in the address, I am desired to state as follows:

4. The Government has no intention of soliciting from the Court of Directors any specific pecuniary aid, to be appropriated exclusively to the support of native literature, beyond the sums already devoted to that object, in conjunction with the encouragement of English literature. Its reluctance to take this step is not influenced by any doubt that larger sums might be beneficially appropriated to both these objects; but by that financial difficulty which necessarily limits within narrow bounds the aid to be so afforded.

5. The Government having resolved to discontinue, with some exceptions, the printing of the projected editions of Oriental works, a great portion of the limited Education Fund having hitherto been expended on similar publications to little purpose but to accumulate stores of waste paper, cannot furnish pecuniary aid to the Society, for the further printing of those works, but will gladly make over the parts already printed, either to the Asiatic Society, or to any Society or individuals, who may be disposed to complete the publication at their own expense.

6. The Government has the highest respect for the Asiatic Society, and the valuable and laudable pursuits in which it is engaged; but must nevertheless consider the Committee of Public Instruction as the appropriate organ for dispensing the patronage bestowed by the Government on Oriental studies, from which, as justly supposed by the Society, it is not the intention of the Government to withdraw its support.

I have the honor to be, &c.

Council Chamber, the 10th June, 1835. (Signed) G. A. BUSHBY, *Secretary to Government.*

Copy of orders issued to the Committee of Public Instruction, 7th March, 1835.

"The Governor General of India in Council has attentively considered the two letters from the Secretary to the Committee, dated the 21st and 22nd January last, and the papers referred to, in them.

"His Lordship in Council is of opinion, that the great object of the British Government ought to be the promotion of European literature and science among the natives of India, and that all the funds appropriated for the purposes of education would be best employed on English education alone.

"But it is not the intention of His Lordship in Council to abolish any college or school of native learning, while the native population shall appear to be inclined to avail themselves of the advantages which it affords; and His Lordship in Council directs, that all the existing professors and students at all the institutions under the superintendence of the Committee shall continue to receive their stipends. But His Lordship in Council decidedly objects to the practice which has hitherto prevailed of supporting the students during the period of their education. He conceives that the only effect of such a system can be to give artificial encouragement to branches of learning which, in the natural course of things, would be superceded by more useful studies, and he directs that no stipend shall be given to any student who may hereafter enter at any of these institu-

tions; and that, when any professor of Oriental learning shall vacate his situation, the Committee shall report to the Government the number and state of the class, in order that the Government may be able to decide upon the expediency of appointing a successor.

"It has come to the knowledge of the Governor General in Council, that a large sum has been expended by the Committee in the printing of Oriental works. His Lordship in Council directs, that no portion of the funds shall hereafter be so employed.

"His Lordship in Council directs, that all the funds which these reforms will leave at the disposal of the Committee, be henceforth employed in imparting to the native population a knowledge of English literature and science, through the medium of the English language; and His Lordship in Council requests the Committee to submit to Government, with all expedition, a plan for the accomplishment of this purpose."

The Secretary hoped he might be allowed to make a few observations on the reply of Government, in consideration of his having been the first to bring the subject of the abandoned publications to the notice of the Society, and to suggest the propriety of its intercession. The warmth with which his proposal had been met by the friends of Oriental literature within and without these walls, and the confidence of some aid from Government for such an object had, he confessed, made him a little sanguine, and had led him to look beyond the sole object of completing the several works actually commenced, to the organization of an Oriental Committee, for extending the benefits of publication to the whole series of classical authors, as had been once intended by the Committee of Instruction;—to include also the nucleus of Bauddha literature, selected by Mr. HODGSON, and the astronomical works recommended by Mr. WILKINSON. But the pleasing dream had now vanished; the reply of Government was before them, and, though none could witness the issue with greater regret than himself—none could bow more submissively to its decree. There was however a passage in the reply, which raised his hopes and encouraged him to make one more effort in the cause; this was the offer to transfer to any Society the whole of the matter already printed, provided it would engage to complete the works. Considering the light in which they were held by Government, "as a mere accumulation of waste paper," it was hardly liberal to couple the offer with such terms; but still he was prepared to recommend to the Society to accept even these conditions. He had made careful estimates of the expences of completing all the works: the Printers had liberally consented to reduce their rates; the pandits and maulavis had volunteered their gratuitous aid for an object so dear to them; and in short he would venture, from the prospect of sales, and of subscriptions for copies from Europeans and Natives of rank, to guarantee the Society from any risk of involving its funds by the acceptance of the Government offer. The Secretary then moved a resolution, which we give in the altered form in which it was finally adopted. The resolution was seconded by Mr. COLVIN:—

"*Resolved*—That with reference to the 5th paragraph of Mr. Secretary BUSHBY's letter, the Society feels disposed to accept the offer of Government to transfer the printed portion of the several Oriental works now in progress to the Asiatic Society, and it entertains a reasonable hope of being able to complete the whole of them without involving any material charge on its funds; but that the

Society should request the Government to withdraw the exception alluded to the Secretary's letter, and to make over the whole of the publications lately in progress at the Education Press. And that the President be requested to address the Governor General in Council, on the subject."

The proposition, as at first worded, applied the epithet "*liberal*" to the "offer of Government," and accepted the offer, "with the exception of the works reserved." It also bound the Society to complete all the works they took over. In the conversation that ensued, the Secretary stated, that much misapprehension existed as to the amount expended by Government upon Oriental literature. He had ascertained, that in the whole ten years, since the publication of such works was commenced, no more than 60,000 Rupees had been devoted to that object; in fact, it was not so much, for this had been the whole charge for printing, and included translations of English works into the native languages. All the charges for translating, for care of the depository, &c. must be considered as part of the expenditure *on education*, with which the Society had no concern.

Mr. MACNAGHTEN thought it needless to bind themselves to complete the works, as Government required no such pledge. He would merely express a disposition to complete the publications.

Mr. TURTON asked what works were excepted by Government. The Secretary said, there were two; the *Fatáwa Alemgíri*, and a Treatise on Spherical Trigonometry, in Arabic.

Sir JOHN P. GRANT thought this did not sufficiently appear, and moved an amendment (seconded by Captain FORBES) to the effect, that Government should be requested to specify what works they intended to except.

Mr. BUSHBY gave his private opinion, that the Society would be permitted to take over the whole, without exception, if they desired it. Mr. TURTON pressed the point. Mr. MACNAGHTEN expressed his opinion, that we should ask for all the unfinished publications. The President thought the proposed reference for further information unnecessary, for they had it before them—the amendment would have the effect of asking for the two works excepted.

After some further conversation, it appearing to be the general wish that Government should be asked to transfer all the unfinished works without exception, Sir J. P. GRANT withdrew his amendment, and the original motion was modified accordingly.

Mr. TURTON wished the word *liberal* omitted. He could not consider the offer of what the Government looked upon as "mere waste paper," a *liberal* offer. The term might be misconstrued, and it was disrespectful to use a word that seemed to be introduced by way of irony. This opinion being assented to all round, the word was taken out, and the resolution was put as above, and carried unanimously.

Mr. MACNAGHTEN then proposed that a letter, becoming the dignity of the Society, in terms respectful to Government, abstaining from any bitter reflections, should be written to the Royal Asiatic Society at Home, forwarding copies of the correspondence with Government. This it was incumbent upon them to do in testimony of their zeal for Oriental literature. He moved accordingly—

"That a copy of the correspondence be sent to the Royal Asiatic Society, in order to show that this Society has not been deficient in zeal in the cause of Oriental literature, as well as in order to engage the support of that powerful body to the cause which this Society has so strenuously but so unsuccessfully endeavoured to uphold."

The Secretary said, there was another reason for doing so, in the assistance they might hope to obtain from the London Society, in promoting subscriptions for copies of the works; and perhaps also in direct aid of their funds from the Oriental Translation Branch of that Society, which must be interested in the same object. He therefore seconded the resolution.

Mr. TURTON wished, before the resolution was put, to say a few words, explanatory of the grounds on which he supported it, differing as he did in some degree on one point, appearing in the correspondence which had taken place, from those whose views in general he fully adopted, and was most anxious to promote. But thinking the object which they had in view one of the utmost importance, he was desirous that it should not be put upon any assumption of right which could not be maintained, especially when it was to be urged to the home authorities. He alluded to the opinions expressed by some of his friends, that the Government were bound by the act of Parliament to appropriate a certain proportion of the funds devoted to literary purposes to the cultivation of native literature, and the native languages, and had no right to withdraw the sums hitherto appropriated through the Education Committee to that purpose. It appeared to him, that this was a misconception, and he should be sorry to see a right set up which could not be maintained; whilst, on the other hand, he would not ask as a favor that which was founded on right. He held in his hands the words of the clause in the Act of Parliament upon which this question depended, the Act 53 Geo. III. c. 155, s. 43, and with the leave of the Society he would read it.

After reading the clause Mr. TURTON continued,

That, setting aside the question, whether Government were bound to appropriate any funds to this purpose at present, it being extremely doubtful whether there was the surplus out of which the fund were to be provided; it appeared to him that the fair construction of the clause which he had read, was to leave the whole discretion of the application of the fund to the local Government. The legislature pointed out the objects of encouragement. In his judgment, it evidently contemplated both Oriental and European literature: but the extent, the time, and the manner in which the one or the other, or both, should receive such encouragement, was, in his opinion, left to the local Government to determine; and if they thought fit to withdraw from the Society the funds which they had hitherto appropriated to Oriental learning, and to appropriate it to the cultivation of English literature and sciences, which had hitherto been wholly neglected, the Society, in his judgment, had no *right* to stand up for. He was also of opinion, with regard to the exercise of its patronage, that the Government were correct. The Education Committee doubtless was the proper channel for the distribution of their funds, entertaining the views which the Government now had. This was a private Society, over which they could exercise no controul; whilst the Education Committee were entirely subject to the directions of Government. But at the same time he thought the Society deserving of some consideration, more than at present the Government seemed disposed to accord.

They were embodied many years before the attention of Government was directed by the legislature to these important objects, and they had steadily pursued their purpose, and expended considerable sums, raised by mere private contribution, on Asiatic Literature and subjects connected with it. It was peculiarly within the province of the Society to represent to the home authorities the error,

into which, in the judgment of the Society, the Government had fallen. He was satisfied, that the very object which the Government had in view, and in which he (Mr. TURTON) most cordially concurred—introduction of the English language, literature, and sciences—would be greatly defeated, or at least retarded, by creating an impression, which the withdrawal of these funds would create, that they wished to discourage,—at least, were indifferent to, the literature of the East, and the ancient languages of the country. He wished to see the two objects united, and was satisfied, that English literature would be more readily introduced, by going hand in hand with that to which learned natives were naturally more attached. The latter was peculiarly within the province of the Society to protect and guard. We had assumed a trust which we must not betray, and when we saw the interests of that literature of which we were the voluntary guardians injuriously affected, and, as we thought, injudiciously attacked, it was our duty not to slumber at the post which we had taken upon ourselves to watch and to defend.

Mr. PRINSEP agreed in much that had fallen from his friend who had just spoken; but Mr. TURTON, not having been present at the last meeting, had mistaken the views of the Society: they had never insisted on an exclusive application of the Parliamentary vote to Oriental literature. But it was impossible to construe the words "revival of literature" otherwise than as intended to embrace Oriental literature—the only literature that could be *revived*. There was another clause perhaps more important still, providing for English science; the Society's business was only with the first. The withdrawing of the minute fraction of the fund devoted to this object, which he must attribute to the Education Committee, was an insult to the natives of India. The laws of the country, as well as its theology and history, were in those languages, and in those books which it was now attempted to suppress. It was not unlikely that the natives might be stimulated by this proceeding to do themselves what it was our duty as their guardians to do for them; but the reputation of the British Government would suffer. Civilization and general information would never be spread through this vast country by English education. Did ever a Government succeed in so wild a project as to change the language of the country? Russia has set us a very different example: she is making rapid strides in civilization by translations into her own language. There was indeed one notable instance in the attempt of Christophe, the late Emperor of Haiti, to extinguish the French idiom, and introduce English in its place—and his mad experiment and himself had fallen together. The literature of the West must be transferred into the native languages, and the first step towards this must be the cultivation and improvement of those languages themselves. He believed Mr. TURTON'S opinions were in accordance with his own; but he wished to go further than the proposition before them, and should therefore follow it up with a motion for a Memorial to the Authorities at Home.

Mr. TURTON explained.

Mr. COLVIN was grateful for Mr. TURTON'S clear exposition of the point of law, but did not see the object of the present discussion. The question before them regarded an address to the Royal Asiatic Society, which had his cordial support. But Mr. PRINSEP'S attack in a censorial tone and language not over measured, had been directed against another body, which had no representatives or defenders in this place. The question to which he had referred was one of the highest im-

portance, and all parties would unite, for the sake of that truth which was their common object, in desiring to see it become a subject of general interest and discussion. But this was not the scene which Mr. PRINSEP should have chosen for any criticisms on the proceedings of the Education Committee. "*Cur in theatrum Cato severe venisti?*" The debate here was totally out of place and character. Mr. TURTON had said, that it was proper to pay respect and attention to Native feeling: who ever held a contrary opinion? It was not he alone who said it—*non meus hic sermo*,—but there was the declaration of Government in the Resolution of the 7th March, that *while the Natives themselves desired it, Instruction in Oriental Learning would be continued*. Were Gentlemen to carry their patronage of that course of tuition beyond even the wishes of the Natives? It seemed to him that there remained but little ground of difference between them. It had happened in this as in other cases,

"When hot dispute had past
They found their tenets much the same at last."

He would readily support Mr. MACNAGHTEN'S resolution—which was then put and carried unanimously.

Mr. PRINSEP, after a few words of preface, moved the appointment of a Committee to Memorialize the Court of Directors and Board of Control. An amendment was proposed by Mr. W. GRANT, who would modify the wording of the resolution to secure unanimity. He wished to disconnect the proceedings from the disputes to which the allusion had been made, which the Society need not notice. This drew forth some remarks from Sir EDWARD RYAN, who expressed his full concurrence in the object aimed at, but objected to certain expressions in Mr. PRINSEP'S motion, as conveying a censure upon the Government, and a declaration on the legal point. His desire was to adopt the most conciliatory and most effectual means of attaining the end.

Mr. COLVIN would agree to Mr. W. GRANT'S amendment, and hoped the members would come to an unanimous vote on this question, as they had done on the others. There would thus be an end to the unnecessary discussions which here and elsewhere had been carried on *usque ad nauseam*.

Mr. TURTON also liked unanimity, but would not seek it at too great a sacrifice: he would not blink the question. We must tell the Government at home, why we go to them. Mr. COLVIN'S unanimity was good in its way, but for himself he liked consistency. "In another place (says Mr. COLVIN), I am decidedly of a different opinion, but let us be unanimous here." This sort of consistency he did not understand. There were societies at home which supported Scotch literature, Welch literature, Irish literature; and why should we consider the ancient literature of India less dear to the natives of this country? To proceed as the Government are doing is to make them think we have only our own interested objects in view.

Mr. COLVIN explained. He had ever been a friend to all descriptions of literary pursuit, and he was a friend to Oriental literature, and could support it as a member of this Society, without compromising his opinions regarding the best plan for the education of youth, a subject of which it was quite beyond the province of the Society to take any cognizance.

The amendment was then re-modelled, and being re-moved by Mr. W. GRANT, and seconded by Mr. TURTON, was unanimously adopted as follows:

"That it be referred to a Committee to prepare a Memorial from this Society to the Court of Directors and Board of Control, stating that Government here have withdrawn the funds hitherto appropriated to the revival of Oriental literature in this country,—and respectfully impressing upon the authorities at home, the importance of having some public funds appropriated to this purpose, and requesting them to adopt such means as they think fit for providing a sufficient sum for this important object."

The following Gentlemen were named as the Committee: Dr. MILL, Mr. MACNAGHTEN, Mr. TURTON, Mr. WM. GRANT, Mr. COLVIN, and Mr. PRINSEP.

Library.

Read a letter from Professor H. H. WILSON, forwarding, on behalf of Counseller VON HAMMER, a copy of his translation and text of the work entitled, "Samachscharis Goldene Halsbander," or the Golden Collar of Samaschari, for presentation to the Society.

Read a letter from J. G. MALCOLMSON, Esq. Secretary to the Medical Board at Madras, transmitting a copy of his publication, called "Essay on the History and Treatment of Beriberi," for presentation to the Society.

Read a letter from Colonel W. CASEMENT, Secretary to the Government of India, Military Department, forwarding on behalf of the Government of Fort. St. George, a second volume of Result of Astronomical Observations made at the Madras Observatory, by T. G. TAYLOR., Esq. H. C. Astronomer, during the years 1832 and 1833.

Also a letter from Mr. EDWARD WALPOLE, to the President, presenting for the Society's Library, a set of Reports and Plans of the Boundary Commissioners under the Reform Bill, from the library of his brother, the late RICHARD WALPOLE, Esq. long a Member of the Society.

A copy of Select Specimens of the Theatre of the Hindus, translated from the Original Sanscrit, by Professor H. H. WILSON, Second Edition, presented to the Society by the Translator.

Meteorological Register for May, 1835, by the Surveyor General.

Lardner's Cabinet Cyclopedia, England, vol. iv. was received from the Booksellers.

Museum.

A Stuffed Alligator, measuring about 11 feet, and the head and horns of a Buffalo, were presented by Lieut. ROBERT C. NUTHALL.

Specimens of Gold Dust from the Streams of the lower range; also, three more ancient Coins from the ruins at Behat, were presented by Captain CAUTLEY.

A Portrait of the late R. HOME, Esq. was presented by his pupil Mr. A. GREGORY, to be added to the gallery of pictures lately deposited in the Society's rooms by the sons of that eminent artist.

Mr. GREGORY also submitted a short eulogium on his deceased master.

Papers submitted.

Dr. J. MCCLELLAND presented a manuscript volume on the Geology, Natural History, and Climate of the province of Kemaon; illustrated by a large geological map, and sections of the whole mountainous district, for most part filled in from his own surveys and examination.

[The manuscript was subsequently withdrawn by the author, for separate publication.]

Observations on Organic Fossil appearances of a peculiar nature found in Kemaon, by the same author, were also submitted.

VIII.—*Miscellaneous.*

1. *Proposal to publish, by Subscription, an Illustrated Work on the Zoology of Nipál.*

It is impossible to advert to the perishable, varying, and complex phenomena of animation, without a deep impression of the disadvantages under which zoological research, has heretofore been conducted, from an almost total disunion of opportunity, and of the skill to make a proper use of it. Mineralogy, and even Botany, may be easily and effectually prosecuted through the medium of materials collected in one country, and used in another and remote one; because these materials are subject to no, or to small deterioration; because their bulk is limited, and their character fixed. Hence probably the rapid progress of these sciences, owing to the ample and effectual means of illustrating them which the learned of Europe have been able to draw from all quarters of the world. The case is very different in regard to Zoology. The transport to Europe of live animals, even birds, is difficult and expensive: the observation of habits, manners, and economy can only be made on the spot, with the advantage (never possessed by travelling collectors) of much time and recurring opportunity: the characteristic form and corporeal habits of animals evanish from the dried specimen, which besides can tell little or nothing truly of those numerous changes to which the living individual is subject from age, from sex, and from season: lastly, it is not possible without *abundance of fresh* specimens, continuously supplied and used without delay, either to fix the real external character of species amid the changes just adverted to, or to ascertain, even summarily, their internal structure.

True it is, that from the external conformation of the hard and imperishable parts of dried animal specimens, that of the internal and untransportable parts may be *inferred:* true it is, that from the unknown genus or family, the unknown figure may be *conjectured.* But who that has been never so little imbued with the Baconian principles of investigation will be content to substitute analogical induction for plain fact, when the latter is accessible? and who that has turned his attention never so slightly to works of natural history, is unaware that this inductive process has resulted too often in monstrous disfiguration of the forms of animals, and in serious errors relative to their internal structure, habits, and economy? The scientific men of Europe have made the best use possible of their miserably defective materials: but they are precisely the persons who deplore the defect of those materials, and its necessary consequences, viz. the multiplication of imaginary species, and the continuance of a wretched system of arrangement, calling every year more imperatively for revision, and yet incapable of being remoulded, without a knowledge of the internal, as well as external, structure, the habits, and economy, as well as true forms, of the actual species, in their mature and perfect development.

A gentleman who has been, for some years past, fixed in a favorable situation for observing nature, with more leisure than usually falls to the lot of the

servants of Government in India, has amused himself by the formation of a large stock of drawings and notes, calculated to illustrate the Zoology of the district in which he resides: and he proposes by placing these drawings and notes in the hands of some true minister and interpreter of nature at home; and by establishing a system of reference between such an one and himself, to complete his observations, during the next two or three years, under the guidance and counsel of ripe science. The object of this gentleman is not to exhibit himself as a Zoologist, which he is not; but to aid Zoology, by *marrying opportunity to skill*—a project which he has means of accomplishing to an extent not hitherto attained, nor likely to be attempted by others, with his advantages for its successful attainment. It is not pretended, that the gentleman in question has means or ability to supply the European master of the subject, with a tithe of the information, the want and necessity for which have been above adverted to. But it *is* affirmed, that the author of this paper (the more immediate purpose of which will be presently explained) *has* such power and will to do away with the divorce of opportunity from the ability to make the best use of it, as are not likely soon to recur; such power and will, as cannot fail to be highly efficient, is put in action in the manner he proposes, in partially removing the obstacles heretofore resulting from that divorce. The series of drawings is now nearly complete, and embraces several hundreds of subjects, each of which has been compared with several fresh specimens, in order to fix the perfect aspect of maturity in the species with such variations, caused by feminity or nonage, as it seemed desirable to delineate. The notes include many particulars of internal structure, habits, and economy, of every subject pourtrayed by the pencil; and it is believed, with reason, that if these materials were put into the hands of an experienced Zoologist in Europe, under whose suggestions their differences might be remedied by further observation and dissection, the result of such a conjoint plan must be to pour a flood of light upon the zoological treasures of one of the most fertile regions of India.

Some inquiries have already been made touching the feasibility of such conjoint labours; and the answers, from the highest quarters, encourage the notion of it, except only in the article of expense, in reference to the drawings; the publication of which, without the aid of subscription, it is apprehended might mar an otherwise most hopeful plan.

Hinc illæ lachrymæ! Hence this proposal, which is intended to solicit the aid of such gentlemen in and out of the service, as are disposed to favour the project by subscription to the work.

Specimens of the drawings may be seen, at the Asiatic Society's rooms.

The amount of subscription will be fixed so soon as there appears to be a prospect of realizing the object of it: and to ascertain that point, all those who are inclined to patronise the work are requested to send their names to the Secretary of that Society.

2. *Proposed Meteorological Combination in Southern Africa.*

We are indebted to Sir JOHN HERSCHEL, for a copy of the printed instructions for registering meteorological observations at various stations in Africa, and in the South Seas, drawn up by a Committee of the South African Philosophical Institution.

This eminent philosopher has, we doubt not, been the prime mover of this important plan for obtaining a connected view of the winds and weather in the

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of June, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer at 32°.	Wet Barometer, do.	Aqs. Ten. deduced.	Thermometer in air.	Diff. on M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Aqs. Ten. deduced.	Thermometer in air.	Different.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.
1	29,580			89,0				,471	,083	1,388	89,8	7,6	7,6	90	75,6	118,9	0,05	o.	s.	sw.	clear.	fine.	gathering.
2	,598	28,266	1,322	88,4	6,7	3,7	92	,480	,070	1,410	92,3	10,2	10,4	85	78,3	127,5		o.	sw.	sw.	do	do	fine.
3	,630	,234	1,396	89,8	5,9	2,5	94	,528	,126	1,402	92,0	9,6	9,9	84	82,0	110,3		S.	se.	se.	cloudy.	cir. do str.	do
4	,612	,229	1,383	90,0	8,0	2,4	88	,513	,048	1,465	92,5	11,6	11,4	84	79,8	118,9		S.	se.	se.	cumuli.		do
5	,719	,312	1,407	90,0	8,4	3,7	89	,556	,066	1,490	92,9	12,0	12,4	84	78,3	116,1		S.	se.	se.	do	cir. cum.	do
6	,755			86,1				,619			89,0				77,0	134,2		S.		S.	cum. str.		ovt. n. wr.
7	,700			87,0				,591			82,1				79,3	135,0		S.		se.	cumuli.		gathering.
8	,648	,314	1,334	88,6	6,4	6,2	89	,468	,046	1,422	91,6	11,1	11,3	86	74,0	117,0	2,60	S.	nw.	sw.	hard rn.	cir. str.	drizzle.
9	,626	,248	1,378	89,3	7,5	7,6	89	,527	,134	1,393	91,1	8,0	9,1	88	79,0	122,0		S.	se.	se.	scud.	fine.	clear.
10	,635	,286		86,2				,557			87,5				77,0	126,0		se.	S.	s.	cumuli.	do	do
11	,649	,286	1,363	89,7	6,7	6,0	89	,546	,106	1,440	91,3	8,9	8,5	88	82,0	123,0		S.	S.	S.	do	do	do
12	,588	,216	1,372	89,3	6,9	1,3		,468	,078	1,490	92,1	10,0	10,3	84	78,0			s.	sw.	sw.	do	cum. str.	rain.
13	,488	,174	1,314	88,7	4,6		89	,474	,298	1,176	86,9	7,5	7,7	89		123,0	0,65	o.	sw.	nw.	haze.	hazy.	do
14	,483			82,5				,420			82,8				74,0	105,0	2,20	o.		o.			threatening.
15	,562	,346	1,216	85,4	6,6		89	,478	,198	1,280	87,1	5,4	6,2	89	70,0	105,0		nw.	se.	nw.	hazy.	overcast.	hazy.
16	,571	,348	1,223	85,9	5,8	4,7	91	,464	,148	1,316	88,3	8,6	9,0	88	76,2	107,2		n.	sw.	nw.	cirri.	cum. str.	misty.
17	,549	,346	1,203	85,7	4,6	1,0	91	,489	,206	1,283	87,4	6,0	6,5	91	77,8	95,2	0,10	ne.	ne.	ne.	hd. rain.	drizzle.	cum. str.
18	,560	,348	1,212	86,4	4,7	1,2	91	,536	,262	1,274	87,3	3,7	4,7	91	77,8	93,2	0,50	E.	S.	se.	cumuli.	fine.	do
19	,608	,430	1,178	86,1	5,3	1,3	91	,572	,334	1,238	86,7	5,0	5,7	91	77,0	90,5	0,15	S.	se.	se.	hazy.	hazy.	cloudy.
20	,570	,392	1,178	86,0	6,3	5,4	91	,527	,298	1,229	86,5	4,7	5,1	91	76,7	103,0	0,10	S.	sw.	se.	fine.	do	rain.
21	,522			83,1	7,8			,411			85,4	8,0	7,5		78,8	108,6		S.	s.	sw.	overcast.	overcast.	cir. str. fine.
22	,478	,240	1,238	86,1	4,8	4,3	91	,372	,170	1,202	86,1	3,6	4,4	91	77,2	94,6		W.	sw-	se.	do		overcast.
23	,410	,322	1,088	83,7	2,8	2,6	91	,389	,292	1,097	83,8	2,6	3,5	91	74,5	100,0	1,50	sw.	se.	se.	sett. rain.	cloudy, rain.	sett. rain.
24	,479	,334	1,145	83,9	4,5	3,8	91	,388	,180	1,268	85,9	4,3	4,7	91			1,30		s e.	sw.		hazy.	cloudy.
25	,410	,299	1,111	84,3	4,0	3,6	91	,327	,196	1,131	84,7	3,4	3,5	92					sw.			fine.	cir. strat.
26	,426	,298	1,128	84,7	3,4	3,0	92	,358	,220	1,138	85,0	3,1	3,8	92			1,20		se.			hazy.	hazy.
27	,489	,346	1,143	83,7	5,5	4,4	92	,360	,266	1,094	83,9	4,2	5,3	92			0,15		sw.			do	drizzle.
28	,483			80,3	3,0			,411			81,5	8,0	7,7				0,60		W.	S.		rain.	cir. str.
29	,510	,400	1,110	83,8	3,3	3,0	91,8	,368	,292	1,076	83,5	2,7	2,8	92	74,5	84,0		o.	sw.	se.	cloudy.	do	do
30	,500	,428	1,072	83,2	3,3	2,5	92	,412	,286	1,126	84,0	3,0	3,9	92	76,	87,5	0,40	e. se.	sw.	se.	do	misty.	do
Mean,	29,561	28,311	1,240	86,1	5,6	3,8	90,7	,480	,179	1,282	87,4	6,9	7,0	89	76,7	110,2	11,50	variable.			rain moderate.		

Instruments the same, and situated as usual. It should be noted, that the Thermometer by which the temperature is registered this year, has been that attached to the Barometer, that the aqueous tensions might agree with it; this instrument hanging against a wall in the laboratory differs a degree or two (being higher in the morning and lower at 4 P. M.) than the Thermometer suspended in mid air, but the average agrees therewith.

Power of letters	Hebrew or Chaldaic	Syrio-persic Zend of Sassanian Inscriptions according to Lichtenstein ditto from Ker Porter	Pehlevi of Inscriptions corrected from Ker Porter	Pehlevi of Sass.n Coins from actual Coins from Marsdens Num. Or.	Bactrian Pehlevi from Bactrian and Indoscythic Coins from Cabul the Panjáb &c.	Bactrian Pehlevi from the Writings on the Cylinders found in the Topes or Tumuli in the Panjáb &c.	Zend Alphabet according to Burnouf's Commentaire sur le Yaçna.
A	א				(see a')		a o a a a
B	ב						
G	ג						
D	ד						gh g
h.e	ה						zh d
U	ו						
Z	ז						v u u ô o
chx	ח						zh z
T	ט						
I	י				med. init.		é
K	כ ך						
L	ל						r
M	מ ם						
N	נ ן						ng n
S	ס						
á ε	ע						
p φ	פ ף				f		ph p
ts	צ ץ		ch				j ch
q.x	ק						ksh
R	ר						
sh	ש						
t. θ	ת					doubtful	
			min.		?		
	מלכא					málaká in 5 character's	

Hyvree Sc.

Inscriptions in Greek and Pehlavi on Bactrian Coins.

1 ΒΑΣΙΛΕΩΣ ΜΕΓΑΛΟΥ ΕΥΚΡΑΤΙΔΟΥ

2 ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΜΕΝΑΝΔΡΟΥ

3 ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΑΠΟΛΛΟΔΟΤΟΥ

4 ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΕΡΜΑΙΟΥ

5 ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΑΖΟΥ

6 ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΑΖΙΛΙΣΟΥ

7 ΒΑΣΙΛΕΩΣ ΑΝΙΚΗΤΟΥ ΦΙΛΟΞΕΝΟΥ

8 ΒΑΣΙΛΕΩΣ ΝΙΚΗΦΟΡΟΥ ΑΝΤΙΜΑΧΟΥ

9 ΒΑΣΙΛΕΩΣ.....ΝΩΝΟΥ

10 ΒΑΣΙΛΕΩΣ ΝΙΚΗΦΟΡΟΥ ΑΝΤΙΑΛΚΙΔΟΥ

11 ΒΑΣΙΛΕΩΣ ΑΝΙΚΗΤΟΥ ΛΥΣΙΟΥ

12 ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΥΝΑΔΦΕΡΡΟΥ

13 ΒΑCΙΛΕΩΣ ΣΤΗΡΟΣ ΣΥΛΟ.....?

14 ΒΑCΙΛΕΥC ΒΑCΙΛΕΩΝCΩΤΗΡΜΕΓΑC ΟΟΜΝΚΛΔΦΙCΗC

15 .....ΚΛΔΔΑΦΕC.....ΧΟΡΛΝΟΥ.....

Titles and Epithets.

16 ΒΑΣΙΛΕΩΣ

ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ

17 ΜΕΙΑΛΟΥ

18 ΣΩΤΗΡΟΣ

19 ΑΝΙΚΗΤΟΥ

20 ΝΙΚΗΦΟΡΟΥ

Names of Princes

21 ΑΠΟΛΛΟΔΟΤΟΥ

22 ΑΝΤΙΑΛΚΙΔΟΥ

23 ΑΝΤΙΜΑΧΟΥ

24 ΑΖΟΥ

25 ΑΖΙΛΙΣΟΥ

26 ΕΥΚΡΑΤΙΔΟΥ

27 ΕΡΜΑΙΟΥ

30 ΦΙΛΟΞΕΝΟΥ

32 ΣΥΛΟ....(ΚΑΔΦΙC).

28 ΜΕΝΑΝΔΡΟΥ

29 ΛΥΣΙΟΥ

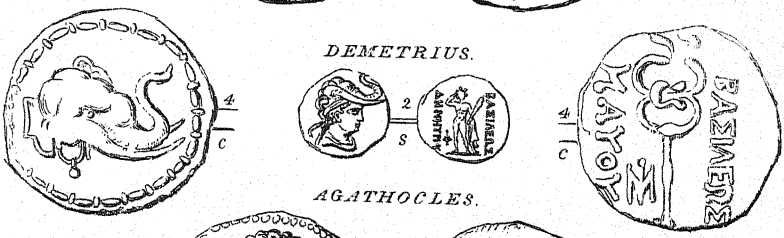
31 ΝΩΝΟΥ

33 ΥΝΑΔΦΕΡΡΟΥ

Bactrian Coins.

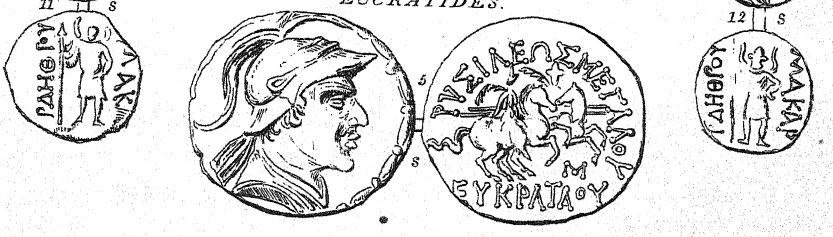
EUTHYDEMUS.

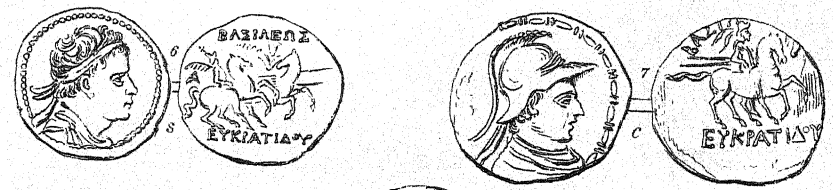
DEMETRIUS.



AGATHOCLES.

EUCRATIDES.

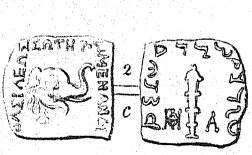


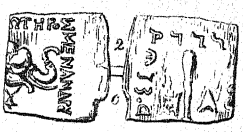
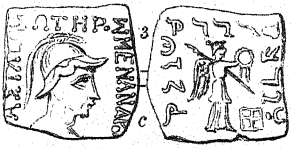


J. Prinsep, del. et sculp.

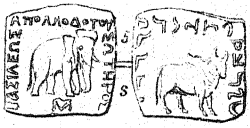
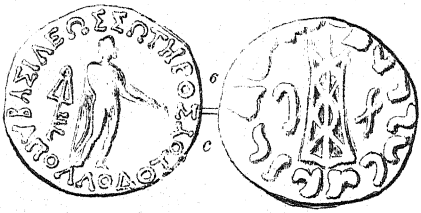
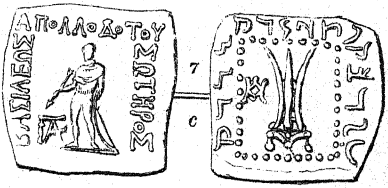
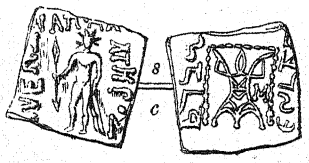
Bactrian Coins.

MENANDER

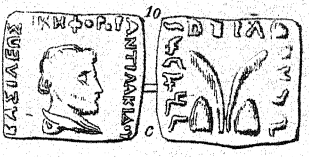


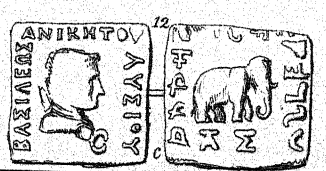
APOLLODOTUS

ANTILAKIDES



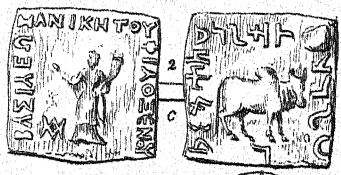
LYSIUS



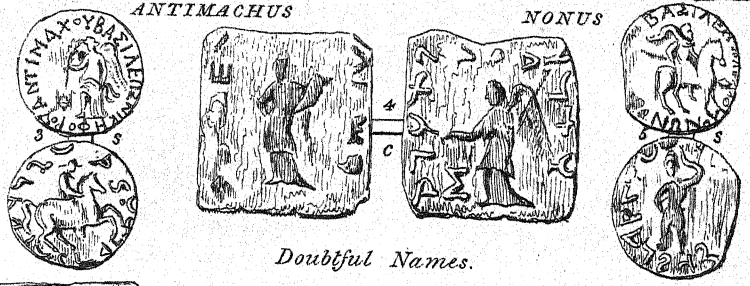
Bactrian Coins

PHILOXENUS

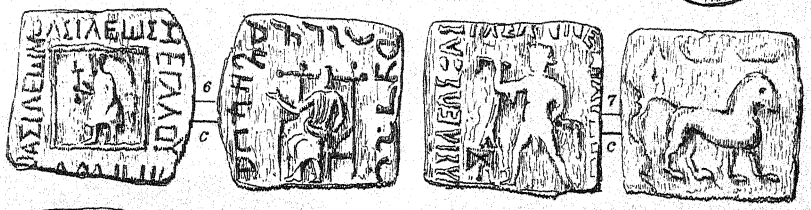
ANTIMACHUS

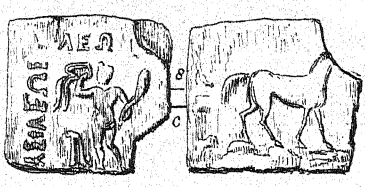


NONUS

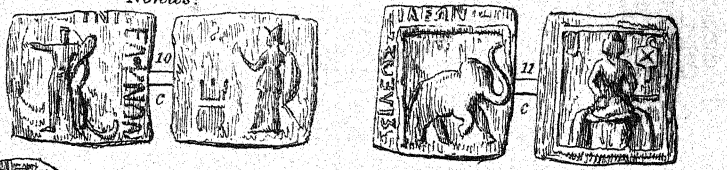


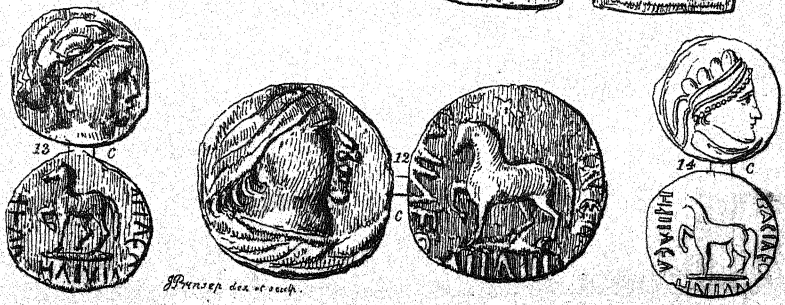
Doubtful Names.





Nonus?





J.Prinsep. del. et sculp.

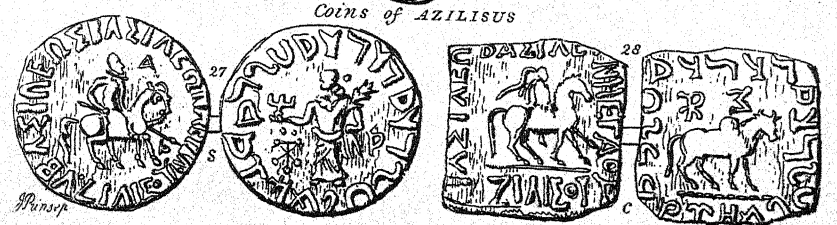
Bactrian Coins.

AZUS

Bactrian Coins.

AZUS

Coins of AZILISUS



JRainsep.

Bactrian Coins.

ERMÆUS.

UNADPHERRUS?

EOS KADPHICES. or ERMÆUS?

KADAPHES CHORANUS

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 43.—July, 1835.

I.—*Notice of the Temple called Seo Byjnauth, (Siva Vaidyanáth) discovered* by Sergeant* E. DEAN, *on the 3rd December, 1834, on the Hill of Unchápahar, in the Shekáwatí Territory.*

[Read before the Asiatic Society, 5th August, 1835.]

[Some days prior to the arrival of Mr. DEAN'S facsimile of the inscription referred to in the following paper, another facsimile of the same inscription, taken by Dr. G. C. RANKIN, was presented to the Society, (see Proceedings of the 11th March, 1835.) This unfortunately was so much smeared, and injured by rain, on the way down, as to be totally illegible. Mr. DEAN has the credit, therefore, of putting us in possession of the best, though not the first copy of this ancient and valuable record. It is to his friend Sergeant BUTTRESS also, that we are indebted for the sketches of the architecture of the ruined temple. Lieut. KITTOE, who has kindly undertaken for us the task of lithographing the columns, has also added a note on the date of this peculiar style of Hindu architecture; having himself bestowed much study on the Hindu remains in the Western Provinces.—ED.]

Plate XXVII.—Unchápahar† (the high hill) rears its bluff head about five miles S. E. of Sikar, and by its superior height alone, would be a conspicuous object, within 15 or 20 miles: as when seen from a greater distance, the outline would become blended with the general masses of hills intervening and flanking it; but it forms a decided and prominent landmark for a much larger circle, owing to its exact position being indicated by a tall spire, which can be distinguished above the tops of all the surrounding hills at such a distance, as to appear

* I say *discovered*, as the resident bráhman informed me, they had never seen an European on the hill before, and one of them, an old man, had been reared here.

† Dr. RANKIN designates the hill *Harsh*, from the name of a village on the spot.—ED.

not higher than the human figure, although about 80 feet high; and even when viewing it at the distance of two coss from the bottom of the hill, I still thought it might possibly be formed of one block of stone, (as I had been informed it really was, by a Dourah, from the hill fort of Rowasah, who had been residing all his life within five or six miles of it,) which would entitle it to be classed among the Láths. Fully expecting to find it so, I ascended the hill by the only regular path, or rather causeway, which begins at the south side of the village of Hurse, and is paved with stones laid flat and on edge. It is 12 feet wide, and takes a general zigzag direction to the southward. The turns of each zigzag are particularly distressing in getting up, as there are no landings, but one slope is led into another. The whole length of the ascent is computed by the inhabitants of the neighbouring villages to be one wurrum coss. I imagine it cannot be less than one and half mile, with an average slope of two feet in 10.

On the way up by the side of the causeway, where the ground will admit, several small chabutrás are raised, two or three feet high, on each of which is set a block of stone on end, blackened with smoke and oil: and about a quarter distance from the top, a singular building of cubical form appears, (Plate xxviii. fig. 1,) standing on a natural platform; the length of whose side is about 10 feet. It is dedicated by the present generation to Devi. Its singularity consists in the peculiarly massive structure of a building of such a size. Set in the wall, opposite the door-way, are three or four stones, on which are carved in bass relief, various symbols, among which are three figures of an animal resembling the Nyl Gao*, more than the domestic cow, having no hump, a short tail, and a neck very like the former animal. I have given a sketch of some of the principal symbols, (figs. 2, 3, and 4,) as they may throw a light to assist in tracing the origin of the temple above, with which I think it is more than likely they are cotemporary.

About 100 yards from the upper end of the causeway, on passing the crest of the hill, stands a Binising Mandir, dedicated at present to Ganesh. It is built of about 45 cubical blocks of stone, without mortar or any connecting body; the side of each cube is about one foot. It forms an enclosure to the N. S. and W. but open to the E., and has no roof. The stones are extremely well hewn, and without the slightest ornament. Some mutilated figures are lying on the ground at the inside of the west face, (fig. 5.)

* The Nyl Gao is an object of peculiar sanctity in this country; the penalty of the crime of killing one is loss of nose, ears and estate, and expulsion from the village to which the perpetrator may belong.

The surface of the top of the hill is about one mile long by 100 yards average breadth, and shews many bare spots, where the secondary sandstone, coming to the surface, checks vegetation; there are also large masses of felspar scattered in an unconnected manner over it.

The whole surface of the hill, both sides and top, is covered with jungle of Dhau and Soldhrí, 15 to 25 feet high, and thickly studded with clumps of cactus. The jungle, when I visited the spot, was without leaves, and presented the appearance shewn in the sketch.

On arriving at the building which had principally excited my curiosity from the plain below, I found it occupied a site about quarter distant from the south-westerly end of the top of the hill, and on the precipitous verge of the northern face. The guide and officiating bráhmans informed me, that it may be distinctly seen from the hills round Jeypore, 35 coss S. E. from Sambre, 30 coss south at Midag, and when standing in relief against the dark background of a rainbow, it has frequently been seen from thence and Baudra, two villages or towns in the said territory, distant 45 coss N. E. by E. Such is the native account, which I think is entitled to belief, as I have myself seen it from Taen, a distance of about 40 miles, at least I imagine so, without taking much trouble to find it out. It is a plain building, of a similar though plainer style of architecture, than the Mandirs of Bindraband, Mathura, &c. It is reported to have been built by Seo Singh, a Rájá of Sikar, and great grandfather to the present Rájá, about the year 1718. Many of the stones composing its base are specimens of elaborate and elegant sculpture, the remains of buildings lying in confused heaps near it to the south-west.

These ruins, which are not visible from below, in their present unpretending state, on being discovered, entirely engross the attention; the only remaining perfect parts of them consist of two rows of columns, of exceedingly beautiful proportions and workmanship, covered with exquisite sculpture, every line and harris of which is as finely preserved as if drawn on paper or executed in alabaster. They are 10 in number, (Plates xxix. fig. 1.) These are flanked on either side by square pillars, fig. 2, also beautifully carved, and are brought up through (I must say, for want of a more applicable expression) a ledge, which protrudes 2 feet in towards the centre of the apartment, from each of its four sides being only broken by the two door-ways. I have no idea of the use of this ledge, as it forms no necessary part of the building, neither is it at all ornamental, unless it has been used for the reception of offerings made to the deity to whom the building has been dedicated, or for sacrificial purposes: but its presence

is entirely conclusive of this compartment of the original building being still complete.

These columns and pillars support a stone roof composed of a first set of ribs, whose ends are supported by four columns, forming a square with a side of about 10 feet. Over the point of bisection of each of these sides, another set of ribs are disposed, so that the angles of a second and of course smaller square rest on the centres of the lower ribs. The interstices of these figures are covered in with slabs, forming between each four columns, a beautiful and simple figure, and taken as a whole a roof of the most primeval architecture.

In the northern face of this apartment, a door-way (relieved by an architrave of most elaborate sculpture, divided into twelve compartments, in each of which a group from the Hindu Pantheon occupies a place,) communicates with an inner apartment, (the sanctum sanctorum), around which, at a height of about five feet from the ground, are ranged 17 Jogies, about $3\frac{1}{2}$ feet high, executed in bold demi-relief, in a superior style of sculpture. They are in a very primitive state, as regards their habiliments, and placed in lascivious postures, belonging to DEVI', who herself about six feet high occupies a corner. This figure has no connexion with the buildings, but merely reclines against one of the walls, and has probably been brought here in latter days, although from its style evidently coeval with the others.

In the centre of this room is a Jelahrí, on which stands a Chaumana Mahádeo, worked in marble.

Near the entrance to the outer apartment lies a large slab of black stone, about $3\frac{1}{2}$ inches thick, and 3 feet square, in which is cut an inscription in a fine clear character, in good preservation, of which I have forwarded a *fac simile*, taken with ink on paper from the stone.

About 10 yards in front of the entrance lies, or rather sits, NANDI, sculptured in a block of coarse white marble, with an ornamented collar, and bells hung round his dewlap, and the back of his hump, and another round his neck, about one-sixth larger than life. How this immense block of stone (in itself a curiosity) was ever brought to the top of this hill, considering the imperfect knowledge of machinery possessed by the natives of the present day, is a matter of astonishment to me.

The site of the main building, if we may judge from the remains of an octagonal chaubutra, round the whole base of which are an immense number of elephants, executed in demi-relievo, about a foot high, and each one placed in a different attitude, some of them in the act of destroying a human being, others assisting the Mahaút to mount, others again destroying monsters; and from what remain, I

have no doubt, the ingenuity of the artist must have been exhausted in typifying the sagacity, and different uses to which this wonderful animal may be put. This base is about 30 yards south-west of the part described, and bears every appearance of having belonged to a noble building, of which Nos. 1 and 2 (Plate xxx.) are specimens, being the crowns or upper courses of domes, which have rested on gradually expanding courses, with the carving and style of architecture of which I am convinced a most intimate connexion in the buildings surrounding the court in which the Delhí town pillar stands, might be traced. I will by the first opportunity send you a specimen brought thence, and which will give a good idea of the quality of the stone, and although much mutilated, of the finish of the carving.

The whole of these remains have been worked in freestone of excellent quality, which is no where procurable in the neighbourhood; neither have I met with it any where, but in the buildings before mentioned, at the Kuttab, which are formed of the same sort of stone, but of inferior quality; and the finish of the sculpture will not bear comparison. The natives could give me no account of whence it had been brought.

Lying on the extreme edge of the precipice on which these ruins and temples stand, are 15 or 20 figures, male and female, about one third larger than life, and although exposed to the weather, in very good preservation. The numerous (I had almost said numberless) groups, in some of which there are from 20 to 30 figures, consist of processions, dancers, male and female, and musicians. (The instruments used by the latter are generally the sitara, fife or flute, and drum.) These fragments of sculpture are scattered over a space of two or three acres; besides what from accident or design have fallen over the precipice, as well as others built in the modern structure: and I should think that the whole of the Hindu Pantheon must have been here represented in a style, the pecuniary ability to follow which has, I fear, gradually passed away with the genius which was capable of designing and executing such a work of art.

Not the very slightest tradition concerning these interesting ruins is in possession of the resident bráhmans (three in number), attached to the temples of *Siva Baijnáth* generally, but in particular to that portion of the ancient one now remaining perfect. They say that it is possible that they were contemporary with the palace of the Hursah Murgarie Rájá, the site of which is still known, and which is now level with the surface of the earth, but to the existence of which, other than as ruins, no date can be affixed. The elk, leopard, hog, and nyl-gao, are found in, and in the neighbourhood of, this hill.

Reference to the Map, Pl. XXVII.

This plate is intended to give an idea of the topographical formation of the hill, including the general direction of the ascent by the causeway, and the positions of the different buildings described in the accompanying paper.

The principal objects are distinguished as below:

a village of Harsha (or Hurse of RANKIN).
b causeway.
c temple (fig. 1 of Plate xxviii.)
d Binsing Mandir (fig. 5 of ditto).
e site of the SIVA BAIJNA'TH temple.
f salt lake or Jheel.
g cultivated land.
h jungle.

The site of building from that from the ascent, or No. 3, is an enclosure made of pillars and other fragments of the original building, built up by the officiating bráhmans.

[The names of many villages are mentioned in the annexed translation of the *Harsha* inscription, by Dr. MILL, of which it is desirable to find the locality. On reference to Mr. DEAN, we find that an accurate, though rapid, survey of the whole district was executed, during the late campaign, by the several engineer officers on duty; and we learn from Major IRVINE, that Captain BOILEAU is now engaged in putting the several divisions together, to form a complete map of Shekáwat. Should we find, when we have an opportunity of inspecting this valuable addition to our geography of Upper India, that it will elucidate the subject of the inscription, we will hereafter furnish a map of the vicinity of *Unchápahar*. Of the geological features of the country, Mr. DEAN has collected numerous specimens, now on their way to the Society's museum; he describes the volcanic field as very rich in fine minerals. Of the copper mines of Singhana, we have been also favored with specimens from himself and from Captain BOILEAU.—ED.]

Reference to Pl. XXVIII.

Fig. 1, represents the temple dedicated to DEVI, described in the map as about one-third downwards from the top of the hill.

NOTE.—The dark rectangular spots shewn in the interior are the positions, or nearly so, of Nos. 2, 3, and 4.

Nos. 2, 3, 4. Symbols carved in freestone, and built in the wall opposite the entrance.

No. 5. The Binsing Mandir, dedicated to GANES, situated within a few yards from the top of the causeway, as marked in the plan.

Remarks. This sheet and the plan of the hill are mere sketches, with the measurements guessed at and set down on the spot, so if they are a trifle out, I must plead want of time to be the accurate chronicler of these remains which I would have been, had I had a little of the spare time others had, and with ten times my ability for the office, in the camp. I hope this short notice may serve to point some one's attention to the spot, who could devote a month to the pursuit of tracing the various groups alone: I am sure they would find ample employment.

Note on Pl. XXIX.

Figures 1 and 2, called domes in the plate, represent the upper or key-stones of ceilings of a very ancient style of Hindu architecture, used before the art of vaulting was known in India, i. e. before the Muhammedan conquest. Of this description of ceilings, there are several of most elaborate workmanship, and in a good state of preservation, in the cloisters of the Atalah Masjid at Jonpur, originally belonging to the temple, out of the materials of which the mosque was built.

The same kind are to be seen at the Kuttab at Delhi, and at Kanouj, in their original positions. The rectangular kind, (No. 1,) rests immediately on the architraves, which are often three or more in number, one above the other, either plain or ornamented, and each one slightly projecting beyond the lower one. Those with circular ceilings, (No. 29,) (which have the appearance of a dome,) have usually a single architrave (A), on which is placed a course, consisting of eight stones, placed so as to form an octagon (B), on which is placed a third course (C), placed so as to form a polygon of 16 sides, on which is finally placed a stone (D), such as represented in fig. 2. Each layer slightly projecting beyond the under one.

M. KITTOE.

II.—*Restitution and Translation of the Inscription found in the Ruins of the Mountain-Temple of Shekávatí.* By W. H. Mill, *D. D. Principal of Bishop's College, Vice-President, &c. &c.*

[Read before the Asiatic Society, August 5, 1835.]

The inscription mentioned in the preceding article, is not unworthy of the labour which Dr. G. C. Rankin and Serjeant Dean have severally bestowed on it. Though abounding, like other monuments of the same kind, with much that is little calculated to interest western readers, it is not destitute of philological and historical use, in illustrating the political and literary state of India at the very remarkable period to which it belongs. Its date precedes, by a few years only, the first great invasion of the Mahomedans: who, ever since that period, the close of the tenth century of our era, have so powerfully influenced the civil and social state of the country. The character in which this inscription is executed, joined with the extreme precision of its date, gives it a value beyond that of its own intrinsic information: furnishing, as it does, a definite standard, from which the age of other monuments of similar or more remotely resembling characters may be inferred with tolerable accuracy.

The character, though illegible at present to the pandits even of northern India, presents no difficulty after the deciphering of the more ancient inscriptions, whose characters resemble those of the second on the pillar of Allahabad. This stone exhibits the Devanágarí in its state of transition, from the form visible in that and other yet older monuments, to the writing which now universally bears that name, and which may be traced without sensible variation in inscriptions as old as the 12th century. From the facsimile of Serjeant Dean, I easily transcribed all the legible letters of the inscription into the last-mentioned character: and the circumstance of its being in verse of various measures, (though written according to Indian usage, in unbroken lines like prose,) with the exception of a few prosaic enumerations near the end, helped greatly to the restitution of the reading, where the stone was broken or partially defaced*.

* Of the 49 verses or stanzas of which the poetical part of this inscription consists, 23 are in the measure the most nearly approaching to the freedom of prose, the Iambic Tetrameter of the Rámáyana and Mahábhárata: and one is in the ancient description of metre called *A'ryá*, in which, as in the Anapæstic measures of the Greeks, the aggregate quantity of feet is preserved, without regard to the number of syllables. The remaining 25 (which the great length of some of the metres causes to be the most considerable portion of the whole inscription,) are in various descriptions of lyrical measure, seven in number, in each of which the number and the quantity of syllables is regulated with the same rigour

The subject of the inscription is the erection of the temple, in whose yet splendid ruins it was found, to SIVA MAHADEVA, under a name by which he is not generally known elsewhere—SRI' HARSHA: the latter word (हर्ष *joy*), being still the name of a village in the neighbourhood, and apparently of the high mountain itself, as we learn from the descriptions of the site now published. The inscription, however, connects this name with an event of great celebrity in the mythology of India,—SIVA's destruction of the *Asura* or demon TRIPURA, who had expelled INDRA and his gods from *Svarga* or heaven; and his reception of the praises of the restored celestials on this very mountain: whence the name of JOY is stated to have been derived to this hill, and the surrounding region, as well as to the great deity as here worshipped.

After some of the ordinary topics of praise to SIVA, in which the mythology of the Puránas and the deeper mystical theology of the Upanishads are blended in the usual manner,—and after the commemoration of this peculiar seat of his worship,—the author begins in the 13th of his varied stanzas, to recount the predecessors of the two Shekávatí princes, to whose liberality the temple was most indebted. A genealogy of six princes, of the same distinguished family whose head then held the neighbouring kingdom of *Ajmeer*,—the family of the Cháhumána or Chohán,—is continued regularly from father to son, and terminated in SINHA RA'JA, in whose reign this work appears to have been commenced, A. D. 961. Then comes a seventh king of a totally different family, being sprung from the solar race of RAGHU. The name of this descendant of RA'MA is VIGRAHA RA'JA; but in what character he appears as the successor of the former princes, whether as a conqueror or as a liberator from the power of other conquerors,—and in what manner, if at all, he allied himself to the former race which he is said to have restored, is not distinctly stated in the three verses (19, 20, and 21), where the succession is recorded. We find only that in his liberality to this temple of the god of Joy, he emulated and surpassed the donations of his apparently less fortunate predecessor SINHA RÁJA', and that in his time it was probably completed, twelve years after its commencement, in A. D. 973. From this list of monarchs, which is not without value as illustrating the discordant and divided state of India at this critical epoch of its history, the author passes in the 28th verse to what is of paramount importance in the Hindu mind—the commemora-

and precision as in the greater part of the Odes of HORACE. These seven measures are interspersed with the two other metres and with each other *ad libitum*, as in the drama, and other classical writings of the Hindus.

tion of the chief brahmans of the temple and their predecessors. The princes were but donors and benefactors, but these world-renouncing men are represented as the actual builders, whose spiritual genealogy from preceptor to pupil, the author proceeds to trace. The line when apparently degenerating, is described as reformed by the zeal and devotion of one who is an incarnation of the god NANDI' himself, the greatest of SIVA's attendant deities,—and who, in his mortal state, received command to erect this magnificent temple in the sacred mount of *Harsha*,—a work, however, which was not completed by himself, but by his pupil. After some descriptions and panegyrics, in which due mention is made of what excites the admiration of all beholders of the ruins at this day, the conveyance of the huge stones of the building to this mountain height, the poetical part of the inscription ceases: and the minute account of the year, the month and the day, in which the work was begun and ended, is followed by a list of benefactors of various degrees, kings and subjects, with their several donations of lands to the temple. The whole is concluded with a verse eulogizing benefactions of this nature, and adjuring all future princes, in the name of the great RA'MA, to preserve them inviolate.

The last king VIGRAHA is very probably the YASO-VIGRAHA of Capt. FELL's Benares inscription, the head of the family whence sprung the last (Rahtore) kings of Kányakubja or Kanoj: though WILSON's calculation of only 24 years each for four generations would bring that chief to A. D. 1024, fifty years after the date of this monument, (A. R. vol. xv. p. 461.) But for the same distance of time, deduced from more certain data, I should have been led to identify VIGRAHA's younger brother, whose name occurs in the 26th verse of the inscription, with a prince who in the same year 1024, in conjunction with another Indian chief called BRAHMA DEVA, nearly turned the tide of victory against MAHMU'D GHAZNEVI, after his rapid march from Ajmeer to Somanáth, by arriving seasonably to assist his Guzzerattí countrymen; and whom MAHMU'D, after his reduction of that place, apprehending as a formidable enemy, took prisoner with him to his capital beyond the Indus; whence being sent back to a kinsman of his own, who had been left viceroy of Guzzerat, he succeeded by a most remarkable adventure, in possessing himself of the kingdom of that country. Certainly this prince, whom FERISHTA calls (as well as his kinsman) DA'BSHELI'M*, is called by other authorities, Hindu and Mahomedan, DURLABHA, the same name as that here assigned to the warlike brother of VIGRAHA.

* DOW, vol. i. pp. 74, 79, 82.—BRIGGS, vol. i. pp. 70—80.—AYIN ACBERY, vol. i. pp. 82, 86.

(Line on the stone.)

(I.)

1 * आत्तविघ्नशमनं सुराचितं
पूज्यमेव शिवयाश्लिषोद्भवम् ।
भक्तिमुक्तिपरमार्थसिद्धिदं
तं नमामि वर[दं सदाशिवम् ॥]

(II.)

2 *..... ताकुलितमानसैः ।
स्तूयमानस्तु सद्दैवैः पातु वश्चिपुरांतकः ॥

(III.)

पादन्यासावनुन्ना नमति वसुमती शेषभोगावलग्ना
3 पौरुष्येष्ठैःसकं[पैः* सहितमपि दिशामीश्वरः सा]र्कचंद्रैः ॥
भिन्नावस्थं समस्तं भवति हि भुवनं यस्य वृत्ते प्रवृत्ते
ऽयं श्रीहर्षाभिधानो जयति पशुपतिर्दत्तविश्वानुकंप्रः ॥

(IV.)

सव्ये शूलं चिशिखमपरे दोषणि [तुंगः कुठारो]
4 भूषा [गंगा शिरसि* भुज] गःकण्ठिका नीलकण्ठे ।
नेदृग्वेषश्चिनयन मया क्वापि दृष्टोऽतिचित्र
इत्थं गौर्या प्रहसितहरः सस्मितः पातु युष्मान् ॥

(V.)

वर्षोद्भूतार्यमादित्यहगगणतलं व्याप्नुवाना जलौघै
5 र्न्यक्कुर्व्वाणा[पयोधीन् द्रुतचलि*]तजलानूर्म्मिमालासहस्रैः ॥
देयाद्भ्यर्थितं वः शशधरधवला स्वर्धुनी चंद्रमौलेः
मौलौ लीलां वहन्ती स्फुटविकटदृढ़ाबन्धने चीरिकायाः ॥

(VI.)

6 चंचत्त्वग्रेक्षतान्तर्भुवननगकनीद्दीपसिं[धु*]प्रपञ्चं
विश्वं सेवाप्ररोहि प्रमथमुनिवरैर्यत्यमर्च्यैः सनाथम् ।
यस्येच्छाशक्तिभावादसदपि सकलं जायते लीयते च
सोऽव्याद्वो हर्षदेवो भुवनविरचनासूत्रधारोऽप्रमेयः ॥

(VII.)

7 नूनं वाणाग्निदग्धत्रिपुरपुररिपु[र्जा*] तद्दर्षः सहर्षं
रिंद्राद्यैर्द्देववृंदैः कृतनुतिनतिभिः पूज्यमानोऽच शैले ।

I.—To him who has effected the destruction of all obstacles,—who is worshipped by the celestial gods,—who is to be adored even by SIVÁ herself [his female counterpart or energy],—whose birth is from abstract essence alone,—the giver of religious devotion, of liberation from worldly things, and perfection in what is of paramount and eternal concernment,—to him I reverently bow, the granter of petitions, the ever-blessed SIVA.

II.—May he who is thus praised even by the pure gods, their minds disturbed by his awful power ..... the destroyer of the demon TRIPURA, protect you!

III.—He at whose dancing the earth bows, moved by the rapid tread of his feet, though fixed to the hood of her supporting serpent, and even the whole system of the world, though joined with its chief guardians, *the lords of the several regions of space, together with* the sun and moon, is displaced—he, under the name of SRÍ HARSHA, conquers all, the bestower of compassion on the universe.

IV.—"The three-forked spear in thy left hand, the extended axe in "thy right; thy head-dress the celestial GANGA' herself; a serpent the "necklace about thy blue throat; never was so wondrous vesture as "thine, O three-eyed one, seen any where by me." May HARA, who smiling was thus addressed sportively by his fair consort GAURI', protect you!

V.—May the river of heaven, fair as the moon, which agitated by rains, pervades with her masses of waters in thousands of lines of waves the region of the sun and planets, looking down even upon the rapidly-flowing seas,—may she grant your petition, bearing gentle sport, cricket-like, on the crest of the moon-crowned SIVA, fast bound with its shining horrid ornament [of clotted hair].

VI.—May he, by whose will the moveable universe with its varied expanse of worlds, mountains, rivers, islands and oceans, all long before made internally, yet germinant with adoration, with its lords, the *Pramathis* [attendant deities of SIVA], the most excellent *Munies*, the *Yaties*, and other immortals;—he, by whose will and active power, this universe while yet non-existent, is produced, and by whom it is destroyed; may he, even HARSHA-DEVA, the incomparable architect in the fabrication of the worlds, protect you!

VII.—May SIVA, crowned with the moon, the foe of TRIPURA, who after consuming that demon with his fiery darts, when with joy springing thence, he was adored by the glad troops of liberated gods, INDRA and the rest, on this very mountain, was thence called HARSHA or *Joy*, the name both of this mountain peak, and of the country [adjacent,]

(Line.) योऽभून्नाप्यहर्षो गिरिशिखरभुवोभारतानुग्रहाय
सोऽस्तादो लिंगरूपो दिगुणितभवनश्चंद्रमौलिः शिवात्मा ॥

(VIII.)

8 नर्दन्नेचाघ[*नुन्ना]तनुदहनरुचिश्चीवसंभान्तसत्त्वं
प्रान्तज्वालावलीच्छद्मबलजलमहाधूमधूम्रायितासम्।
खारंभारंभभीमखनमसमशरोच्छेदि यस्याशशंके
दृष्ट्वा देवैः सरूपं किमिह सुसमये संहृतिर्नोभवेत्य[म्]॥

(IX.)

9 [*भृंभुः] पुरध्वगध्वासे यमम्बकषमस्तकः।
हर्षख्यातिः सहर्षाख्यो गिरिरेष पुनातु वः ॥

(X.) भूरस्येदं श्लो।

कांगांगं मे निजं यं प्रवहति न शुभा नन्दकोद्यानलक्ष्मीः
10 सद्रक्तस्वर्णभृंगामलविविधरु [*चिर्वोऽद्रिरेष प्र] पातु।
नान्यां धत्ते तथापि श्रियमतिशयिनीमेष शैवोऽद्वितीयां
साक्षाच्छम्भुर्यदास्ते तदपि हि परमं कारणं रम्यतायाः ॥

(XI.)

अष्टमूर्त्तिर्यमध्यास्ते सिद्धसृष्टविभुः स्वयम्।
11 न समो भूधरस्यास्य परमःक्वापि [विद्यते *] ॥

(XII.)

एतत्स्वर्णाण्डकांतिप्रदरचनमहामण्डपाभोगभद्रं
प्राप्तप्राभातमालाविरचितविकटापाण्डुयुष्माभिरामम्।
मेरोः शृंगोपमानं सुघटितवृषसत्तोरणद्वाररम्यं
नानाहाहाश्रमांकं जयति भगवतो हर्षदेवस्य [सद्म]॥

(XIII.)

12 * आद्यः श्रीगूवकाख्याप्रथितनरपतिश्चाऊमानान्वयोऽभूत्
श्रीमन्नागाद्यलोकप्रकरदृढसभालब्धवीरप्रतिष्ठः।
यस्य श्रीहर्षदेवे वरभवनमयी भौतली कीर्त्तिमूर्त्ति
13 र्लोकेऽद्यापि दिरेषा प्रतपति परमैः[शंसिता लोकवृंदैः*]॥

(XIV.)

पुत्रः श्रीचंद्रराजोऽभवदमलयशास्तस्य तीव्रप्रतापः
सूनुस्तस्याथ भूपः प्रथम इव पुनर्गूवकाख्यः प्रतापी।

for the benefit of BHÁRATA [or India universally],—may he be yours in the form of his phallic emblem, and with his mansion doubled.

VIII.—Whose form, essentially illumined with the fiery light of the immense conflagration, that oft issues from the evil glance of his eye, audibly flashing, darkening even the bow of heaven with the multiplied dense smoke of trees consumed by that long-standing flame,—and which, uttering a tremendous sound at the commencement of the fiery onset, destroyed even him of the incomparable arrows [CAMA or CUPID], and thus became a subject of doubt to the gods beholding it, whether his great periodical destruction of the universe was not perpetually repeated, even in this tranquil time.

IX.—May this sacred mountain, possessed of the glory of the *joy* [above mentioned], and thence called *Harsha*, on which thus sat the eternal SAMBHU, destroyer of TRIPURA, with the breeze of heaven on his head, protect you!

A hero speaks the following verse.

X.—" May this mountain protect you, with pure and varied splendour resting on its peak as of reddened gold, which the beauty—ah, what, is not that beauty? of its pleasant gardens, brings delightfully to my ravished bodily sense! Yet has this mount of SIVA no other transcendent and incomparable felicity, but this, that the eternal SAMBHU sat there: that is the paramount cause of its loveliness."

XI.—To that mountain on which the Eight-formed one, the Eternal endued with eight infinite perfections, chose to sit,—no one of equal excellence exists in the world.

XII.—This temple of the blessed HARSHA-DEVA, splendid by reason of its complement of open chapels around, whose structure is embellished with eggs of gold, delightful for the sweet yellow flowers appended to it, formed into garlands gathered for morning offerings; a temple vying in loftiness with the peak of MERU itself; adorned with a door and sacred porch, on which is a finely wrought effigy of the bull of SIVA; distinguished moreover, as the frequent resort of various celestial songsters—surpasses all others.

XIII.—THE first Prince was celebrated by the name of GU'VAKA, the blessed, of the CHÁHUMÁNA (or Chauhán) family, and obtained heroic eminency amidst the multitude of kings in the several worlds from the infernal world of the blessed Nágas upward: the earthly effigy of whose glory shines forth doubly in this excellent house erected to HARSHA-DEVA, and is celebrated by the most excellent of beings.

XIV.—His son was CHANDRA RÁJA', the blessed, of glory pure as the sky, arrayed in fervid splendour. And his son was again a splendid king,

(Line.) तस्माच्छ्रीचंदनोऽभूत्त्रितिपतिभयदस्तामरांशुः सदर्पं
14 हत्वा रुद्रेण भूयः समरस[मुदये*]लाभ्य[कीर्त्ति]र्जयश्रीः ॥

(XV.)

ततः परमतेजस्वी सदा समरजित्वरः ।
श्रीमान्वाक्पतिराज्यश्रो महाराजाभवत्सुतः ॥

(XVI.)

येनादैन्यं स्वसैन्यं कथमपि दधता वाजिवल्गामुमुच्चै
15 प्रागेव चासितेभः सरसि करिरटद्डिंडिमैर्डु[बयुद्धैः*] ।
विन्ध्यक्ष्माहर्त्तुराजा समदमहिषहन्नागतोऽनंतपार्श्वं
क्ष्मापालस्तंचपालो दिशि दिशि गमितो क्रीविषस्थः प्रसन्नः ॥

(XVII.) सूरस्येदं ॥

लोके यो हि महीतले ननु हरिश्चंद्रोपमो गीयते
16 त्यागैश्वर्यजये प्रकी[र्त्ति*र]मला धर्म्मश्च यस्योज्ज्वलः ।
येनावापि हराय मंदिरकृते कृष्णाप्रसूतं वसु
श्रीमद्वाक्पतिराजसूनुरसमः श्रीसिंहराजोऽभवत् ॥

(XVIII.)

हैममा[स्थापितं] येन शिवस्य भवनोपरि ।
पूर्णचंद्रोपमं स्त्रीयं मूर्त्तयश्चा[रुसंज्ञ] काः ॥

(XIX.)

17 [*हत्वा] तोमरनायकं सलवणं सैन्याधिपत्योद्धतं
युद्धे येन नरेश्वराः प्रतिदिशं निर्नाशिता जिष्णुना ।
कारांतेऽपि च भूरयश्च विधृताश्चारद्विषो बक्कटे
तन्मुक्त्यर्थमुपाश्रितो रघुकुले भूचक्रवर्त्ती स्वयम् ॥

(XX.)

18 श्रीमा[न्वि*]ग्रहराजोऽभूत्तृतीयोवासवोपमः ।
वंशलक्ष्मीर्जयश्रीश्च यूनैते विधुरोद्धृते ॥

(XXI.)

श्रीसिंहराजरहिता किल चिंतयंती
भीतेव संप्रति विभुर्ननु को ममेति ।
येनोच्छ्रि बाहुयुगले चिरसन्निवासं
19 संधीरितेति ददता निज [*रा]ज्यलक्ष्मीः ॥

named like the first, GU'VAKA. From him sprung CHANDANA, the blessed, inspiring terror into kings, of rays which, [like the sun's,] produced showers, who, having once without repetition proudly smitten his foes in the fearful onset of war, obtained glory by this act, and was worthily possessed of the full felicity of conquest.

XV.—Then came his son, the great king, the fortunate VÁKPATI, supremely glorious, perpetually victorious in war, foremost in battle.

XVI.—By whom, possessing a fierce army that loosed the reins altogether from their coursers, even TANTRA-PÁLA, the possessor of conquered regions from the serpent that bears the whole earth, the well-pleased governor of earth with its innumerable regions,—even he, having his elephant terrified and driven into a lake by the sounding cymbals of the hostile war-elephants, was forced to wander through various countries, overwhelmed with the shame of defeat.

A hero speaks the following verse.

XVII.—The son of this fortunate king, VÁKPATI, was the incomparable SINHA-RÁJA, who is sung in this terrestrial world, as equal to the great HARISCHANDRA, whose fame was spotless in the surpassing excellency both of liberality and dominion, and whose justice was resplendent; by whom money procured without deceit was spent upon HARA (or SIVA) for this sacred temple.

XVIII.—By whom was placed on the top of the house of SIVA, his own appropriate emblem, the golden figure of a full moon, and also his eight proper forms.

XIX.—By whom,—when he had slain, together with LAVANA, the leader of the hostile spears, proud of the command of armies,—the kings of men in every direction were annihilated in war through his victorious might, and many also who had opposed his messengers, were detained in a capacious prison of stone:—yet for the liberation of this very king (SINHA-RÁJA) a conqueror of the world of the race of RAGHU voluntarily interposed.

XX.—This was the fortunate VIGRAHA-RÁJA, resembling VÁSAVA, [or INDRA,] when he had performed his adoration [on this same mountain, to the same deity]; by this young prince were the wealth of the race and the prosperity of victory, both rescued from destruction.

XXI.—[For he it was] by whom, when the wealth of the kingdom, deprived of [her husband] SINHA-RÁJA, inquired, as in terror, "Who now will be my Lord?" She was peacefully answered—"Dwell thou in my two arms,"—thus affording her a lasting resting place.

(Line.)

(XXII.)

येन दुष्टदमनेन सर्व्वतः
साधिताखिलमही खबाऽऽभिः।
स्त्रीलयेव वशवर्त्तिनी हृता
किंकरीव निजपादयोस्तले ॥

(XXIII.)

यस्य चारुचरितं सतां सदा
भूरखतां जगति कीर्त्तितं जनैः।
20 हृष्टिजातघनहेमकं[*चुका]
जायते तनुरलं मुऽऽर्म्मुऽऽः ॥

(XXIV.)

मुक्ताहारैः सुतीव्रैः प्रतरखतुरगैश्चारुवस्त्रैश्च भूस्त्रैः
कर्प्पूरैः पूगपूरैर्म्मलयतरुवरैर्हेममारैरपारैः।
उद्यद्दानः समानस्थलकुलतिरि[भिर्हन्तिवारैः सदारै
21 र्निर्व्याजैः प्राति[*रश्चैर्बऽऽ]भिरितिभृतैः प्राहृतैर्यः सिषेवे ॥

(XXV.)

कृचधारा वरग्रामो द्वितीयः शृंकराह्वकः।
तेनैमौ हर्षना[म्ने खभ]क्त्या दत्तौ सशासनौ ॥

(XXVI.)

श्रीमद्दुर्लभराजेन योऽनुजेन विभूषितः।
लक्ष्मणेनेव काकुत्स्थो विष्णुनेव हलायुधः ॥

(XXVII.)

22 [*महा]राजावली चासौ शंभुभक्तिगुणोदया।
श्रीहर्षः कुलदेवोऽस्यास्तस्माद्दिव्यः कुलक्रमः ॥

(XXVIII.)

अनंतगोचरे श्रीमान् पण्डितश्चोत्तरेश्वरः।
पंचार्थलाकुलाम्नाये विश्वरूपोऽभवद्गुरुः ॥

(XXIX.)

23 दीक्षेष्टतमलब्धः स विस्फुर[*न्मंचये]बलः।
प्रभूस्तास्थोऽभवच्छिष्यस्तस्य पाशुपतः हृती ॥

(XXX.)

भुवि रक्षोऽभवत्तस्य शिष्यो दिर्नाम तोल्लटः।
वार्गटिकान्वयोद्भूतसद्विप्रकुलसंभवः ॥

XXII.—By whom also, having effected the conquest of his enemies, the whole earth on every side being overcome, as in sport, with his mighty arms, was as a servant beneath his feet, subjected to his will.

XXIII.—Whose glorious exploits, when good men hear perpetually celebrated by mankind through the world, their body becomes repeatedly encompassed as with a panoply of solid gold, arising from their extreme delight.

XXIV.—Who worshipped SRI' HARSHA with strings of pearls without end; with wanton steeds, and gorgeous garments and weapons; with camphor, with cakes mixed with the fruit of the Areca; with the best sandal-wood of *Malabar*; with immense ingots of gold; with conspicuous gifts composed of the birds of every country and species, of herds of elephants with their mates; gifts without deceit, delightful and most numerous, brought hither by his liege servants.

XXV.—By him, through his exemplary devotion, two villages were presented with suitable deeds of gift to the deity called HARSHA, the best of these called *Chhatradhárá*, the second *Sankaránaka*.

XXVI.—Who also was adorned by his younger brother, the fortunate prince DURLABHA, even as was RA'MA by LAXMANA, and BALARÁMA by VISHNU, [i. e. by KRISHNA.]

XXVII.—This series of great kings had the origin of all their other virtues in devotion to SAMBHU [or SIVA]. SRÍ HARSHA was the tutelar god of their race; hence was their genealogy illustrious.

XXVIII.—THE Spiritual teacher VISVA-RU'PA was a happy and learned master of replies, on an infinite variety of subjects, according to the received discipline of the *Panchárthala* tribe of bráhmans.

XXIX.—His disciple was called PRASASTA; who had attained the choicest mystic formulæ, and was skilled in the interpretation of all that were produced to him; an accomplished devotee of SIVA, lord of beings.

XXX.—His disciple, twice received as such, was one attached to the earth, named TOLLATA, sprung from a holy family of bráhmans of the Vargatika tribe;

(Line.)

(XXXI.)

हर्षस्यासन्ततो ग्रामः प्रसिद्धो राणपल्लिका।
24 सांसारिककुलाम्नायस्ततो यस्य विनि[ःसृतिः*] ॥

(XXXII.)

अ]थाटच्छ्मना नंदी शिवासक्तस्थितिक्रमः।
श्रीहर्षाराधने नूनं स्वयं मर्त्यमवातरत् ॥

(XXXIII.)

आजन्मब्रह्मचारी दिगमलवसनः संयतात्मा तपस्वी
श्रीहर्षाराधनैकव्यसनशुभमतिस्त्यक्तसंसारमोहः।
25 आसीद्यो लब्धजन्मा नवतरवपुषां[सत्तमः*]श्रीसुवस्तु
स्तेनेदं धर्म्मवित्तैः सुघटितविकटं कारितं हर्षहर्म्यम् ॥

(XXXIV.)

अस्मिंश्चंडांकशैले गगनपथिलिहोत्तुंगशृंगेऽप्रमेयं
हर्म्यं श्रीहर्षनामप्रथितपशुपतेः सद्विमानोपमानम्।
26 भूषासङ्घैरयुक्तं बज्रसुरभवनं कारितं येन[रम्यं*]
नासाध्यं किंचिदस्मिन्स्फुटमिति वपुषो निःसृहाणां कवीनाम् ॥

(XXXV.)

आसीन्नैष्ठिकरूपो यो दीप्तपाशुपतव्रतः।
ऐश्वतोग्रतपोऽजातपुण्यापुण्यमलचयः ॥

(XXXVI.)

सदाशिवसमाकारस्तस्येश्वरसमद्युतेः।
27 भवद्योतोऽभवच्छिष्यः संदीपितगु[रुर्म्महान्*] ॥

(XXXVII.)

गुरोराज्ञामयं प्राप्य प्रतिष्ठासोः शिवालयम्।
यथाप्रारब्धकार्याणामंगीकृतहरोऽभवत् ॥

(XXXVIII.)

गुरुस्तात्त्वर्चितस्याधस्थितयं येन कारितम्।
सतपोवाटिकं दिव्यमाप्तप्राघटितोपलैः ॥

XXXI.—Whose origin was from the place which is known as a village in the neighbourhood of *Harsha*, called *Rána-pallikā*, the received discipline of which is that of the worldly tribe.

XXXII.—Then came in disguise NANDI', he whose rank among the votaries of SIVA is most eminent. He of his own accord descended to the state of mortality for the worship of SRI' HARSHA.

XXXIII.—A brahmanical student from his birth—with mere space for his pure covering, [i. e. a pure gymnosophist,] with subdued spirit, addicted to self-torturing exercises, with his excellent mind singly bent with eagerness on the worship of SRI' HARSHA, having forsaken the infatuation of the external world—by him thus living, having assumed birth under the name of SUVASTU, the best of youthful corporeal beings,—and through his discernment of religious duty,—was this ample well-compacted temple of HARSHA caused to be built.

XXXIV.—Seeing thus by whom, on this mountain, bearing the symbol of CHANDA' [the female energy of SIVA], with its lofty peak kissing the path of heaven, an incomparable temple has been raised to that Lord of Creatures, as celebrated under the name of SRÍ HARSHA,—a temple resembling the rapid car of the pure gods, encompassed with ornaments and excellent delights, the habitation of many immortals—it is clear that nothing is impracticable even to the bodily power of sages who have renounced all selfish desire.

XXXV.—Of him [NANDI' or SUVASTU], who was thus of the form of a *Naisthika* or perpetual student, a splendid devotee of SIVA, and who multiplied his exercise of severe self-torment to that degree, that the triple quantity of holiness, unholiness [or passion], and defilement no longer existed within him—

XXXVI.—Of him [I say] thus similar in splendour to the great deity himself, the disciple was the eminent religious teacher SANDÍPITA, who was likewise conformed to the eternal SIVA, and endued with his splendour.

XXXVII.—This [SANDI'PITA] having received command from his preceptor [SUVASTU], who desired to consecrate this house of SIVA, obtained the consent of the deity himself, HARA, to the works as they were already commenced.

XXXVIII.—By whom also in front of what was already dedicated, a third ground-floor, including a hall for self-torturing exercises, and extending as far as the place for distributing water, was splendidly covered with well-compacted stones.

(Line.)

(XXXIX.)

सदैव नद्यमानेन तत्स्नेन खादुवारिणा ।
28 वाटिकासेच[नं *कृत्यं तत्]प्रयाहरणन्तथा ॥

(XL.)

सुपुष्पैरर्च्चनं भृंगोः पयःपानं गवामपि ।
कार्यद्वयमिदं सारेणाश्रितं पुण्यकांक्षिणाम् ॥

(XLI.)

दिगंबरजटाभस्म तथाच त्रिपुरंतपे ।
निष्ठावृत्तिः करः पात्रं यस्यैतानि परिग्रहः ॥

(XLII.)

29 शिवभवनपु[रस्ता*द्दार्यपा]रं यदासीत्
तदखिलमुपलौघैः पूरयित्वा गदेलम् ।
समतलसुखगम्यं प्रांगणं तेन कांतं
महत्तरशिलाभिः कारितं बंधयित्वा ॥

(XLIII.)

वारुद्रसुतः ख्यातः सूत्रधारो[ऽभवद्वि]सः ।
30 विश्वकर्म्मेव सर्व्वज्ञो वास्तुविद्या[विशारदः*] ॥

(XLIV.)

येन निर्म्मितमिदं मनोहरं
भृंकरस्य भवनं समंडपम् ।
पूर्व्वदेवगयचारुतोरणं
स्वर्गखंडमिव वेधसा स्वयम् ॥

(XLV.)

गंगेश्वरभवने का
चंडिकयोरुकसुतेन भक्तेन ।
अकियतेऽद्रा सुगमा
प्रपत्तिरिह धीरनागेन ॥

(XLVI.)

31 यावद्भूदे[वपृथ्वी*गग]नसुरतटीचंद्रलेखायतित्वं
यावल्लक्ष्मीमुरारेरुरसि किल भुवि द्योतते ऽर्कोऽपि भं च ।

XXXIX.—With the sweet water there contained, the sprinkling of this sacred hall is ever to be performed, as well as the whole of the duty attached to the watering place.

XL.—For the worship of SAMBHU by the offering of beautiful flowers, and also the giving of water to the cows to drink,—these two works are alike regarded as meritorious by the choice band of men ambitious of sanctity.

XLI.—Ethereal vesture (i. e. nudity), clotted hair, and ashes; also habitual adherence of mind to the destroyer of TRIPURA, and the hand used as the only drinking vessel—to whom these things were held dear and sacred—

XLII.—by that man was the ornamented area caused to be made, level and pleasant for walking, in front of the house of SIVA, having for this purpose filled up with stony heaps what was before impassable water mixed with unwholesome earth, and firmly bound the whole with the smoothest stones.

XLIII.—For that architect was the famed son of VA'RARUDRA, all-knowing and skilled in house-building craft, even as VISVAKARMÁ.

XLIV.—By whom was built this soul-ravishing house of SANKARA (SIVA),—with its chapels, and its fine portico, graced with the presence of GAYA, the holy *Asura*,—even as it were a fraction of heaven by the will of the Creator VEDHAS [or BRAHMA'].

XLV.—In the house of the Lord of GANGA', what glorious, easy-flowing praise, interspersed with the histories of his consort CHANDÍ, was uttered by the prince of learned men, the religious son of URUKA!

XLVI.—As long as the lords of earth [i. e. the bráhmans], the earth itself and sky, the river of the gods [GANGA'], the lunar varying disk, and the holy occupation of the *Yaties* subsist;—as long as LAXMI' rests on the bosom of MURA's foe [VISHNU], or as the sun and stars shine upon the earth;—as long as GAYATRÍ the best beloved wife remains most closely united with BRAHMÁ, so long may this house of

(Line.) गायत्री यावदास्ते सततमुपनता प्रेयसी ब्रह्मयोनेः
र्ऋक् लक्ष्माहारमुद्यत्प्रतपतु भवनं हर्षदेवस्य तावत् ॥

(XLVII.)

32 ता[*वत्कालग]तः शंभुः कथं कालस्य गोचरः।
हर्म्म्यनिर्म्माणकालस्तु यथादृष्टो निबध्यते ॥

संवत् १०१८ आषाढ़ सु दि १३
भी प्राहति दयी कृय।

(XLVIII.)

जातेऽब्दानां सहस्रे द्विगुणनवयुते सिंहराशौ गतेऽर्के
33 शुभा यासीत्तृ[तीया*]शुभकरसहिता सोमवारेण तस्याम्।
आदिष्टः शंभुनासौ [निजवि]मलपदं दित्सुना शुद्धसत्त्वं
लब्ध्वारेभे ह सर्व्वं शिवभवनमभिप्रस्थितोद्यल्लयस्य ॥

स्वस्ति संवत् १०३० आषाढ सुदि १५ निबद्धं यथालब्धया
34 समनं[तर*]मत्रावलिख्यते।

महाराजाधिराजश्रीसिंहराजः स्वभोगैरनद्य यूकद्वादशके सिंहप्रौष्ठं।

तथा षट्टबद्धकविषये चैकलक्षप्रमाणानुकूपोरुसरः कोहविषये
35 कायहपल्लिकामेवं ग्रामांश्चतुरश्चंद्रांकशिखरोपरि[*सन्य]गवते श्री
हर्षदेवाय पुण्येऽहनि श्रीमत्पुष्करतीर्थं स्नात्वा स्वपनदेहविलेपनो
पहारधूपदीपपर्व्वयात्रोत्सवार्थमाग्रहणांकतपनार्कावस्थितेर्यावच्चास
नत्वेन प्रददौ।

HARSHA-DEVA shine in orient light, its sign not removed from sight, when the sun is shorn of its splendour!

XLVII.—He who subsists when even such duration has elapsed, even SAMBHU the eternal, how can he be defined by time? The time however of the building of this his temple is consigned to writing, as now seen.

In the Samvat year 1018, in the month of A'shádha, the first division of the month, the 13th day. .....

XLVIII.—When a thousand years, with twice nine added, were elapsed, the sun approaching the sign of Leo, on a lunar day, which was the third of the waxing moon, accompanied with a fortunate conjuncture of planets, and on a Monday—then did the builder aforesaid, being commanded by the eternal SAMBHU, who desired to give an undefiled site and endued with essential holiness to his own sacred name,—and having obtained the site accordingly,—commence the whole work of erecting this house to SIVA, who bestows absorption on those who devoutly approach it.

Hail! in the Samvat year 1030, in the month of A'shádha, the first division of the month, the 15th day, the deeds of conveyance, as they were severally received, are written in the following order.

The great king, the king of kings, the blessed SINHA-RA'JA, in the 12th day of the sun's mansion in the sign of Libra, attached [to this temple the village of] *Sinha-prostha*, with its revenues and produce, which were his own.

He likewise made over by deed of gift, as long as moon, sun, and ocean should endure, *Ekalaka*, *Krisánu-kúpa* and *Uru-saras*, in the district named in the deed, together with the hamlet of *Kanha* in the *Koha* district, being four villages in all, to SRÍ HARSHA-DEVA, the all-sufficient protector, seated on the hill whose sign is the moon—on a holy day, remembering the sacred resort of pilgrims *Pushkara*, [or *Pokar* near Ajmeer] for the sake of the solemn celebration of festive journies thither, accompanied with ablutions, bodily unctions, burning of incense and lamps; [that the same may be performed by the Brahmans of HARSHA without loss.]

(Line.) तथैतद्भुक्ता श्रीवत्सराजः स्वभोगावाप्तं जय[लब्ध*]ये कर्द्दम
36 खातग्राममदाच्छासनेन।

तथा श्रीविग्रहराजेन शासनदत्तग्रामद्वयमुपरिलिखितमास।

तथा श्रीसिंहराजात्मजौ श्रीचंद्रराजश्रीगोविन्दराजौ स्वभोगा
37 वाप्तपट्टबद्धकविषयोदर्कंकथनं [*कृत्व]ा संख्यानखहस्तांकितशास
नौ ग्र[हीत उ]दके पाटकद्वयपल्लिकाग्रामौ भक्त्या वितेरतुः।

श्रीसिंहराजीयदुःसाध्यश्रीधंधुकः खङ्गकूपविषये स्वभुज्यमानम
यूरपुरग्रामं खाम्यनुमतः प्रदत्तवान्।

38 [*तथा युवरा]जः श्रीजयश्रीराजः स्वभुज्यमानकोलिकूपग्रामं
भक्त्या हर्षदेवाय शासनेन दत्तवान्।

तथा समस्तं श्रीहर्म्महतेश्या शाकंभर्या लवणकूटकप्रतिविंशाय
हर्षकं दत्तं।

39 तथोत्तरापथीयस्त्राविकाना [म्या श्री*]हर्षकं प्रति प्रेम्न एको
दत्तः।

पुण्यात्मभिर्दत्तानि देवभुज्यमानत्वेनाग्नि पश्यामेहासुरिकायां
पिप्पलवालिकाक्षेत्रं निंबटिकाट्ठिंठादर्भटिकाक्षेत्रं चारुपल्लिकायां

40 नाटचयं हर्षेणाटत्सेतुं[*]गवर्णदेभीकांकक्षेत्रं तथात्वेव दिह
लिकानं विसोमकवृहद्वलमिति।

(XLIX.)

सत्कानेतान्भाविनो भूमिपालान्
भूयो भूयो याचते रामभद्रः।
सामान्योऽयं धर्म्मसेतुर्नृपाणां
काले काले पालनीयो भवद्भिः॥

Likewise, his brother, the blessed VATSA-RÁJA, made over by deed of gift the village of *Kardama-kháta*, whose revenues had been possessed by himself, for the purposes of obtaining victory.

Likewise, two villages were made over with a deed of gift, by the blessed VIGRAHA-RÁJA, as it is written above. [See verse XXV.]

Likewise, the two sons of the blessed SINHA-RÁJA, viz. the blessed CHANDRA-RÁJA and GOVINDA-RÁJA, did religiously convey a hamlet, consisting of two divisions, and a village, with a deed of gift entirely written with their own hand, even to the prescribed formal enumeration [of name, family, date, &c.], having first taken the holy water; thus having made a record to all future times concerning the district described in the deed, whose revenues were (till then) possessed by themselves.

The blessed DHANDHUKA, though unconquered by the subjects of SINHA-RÁJA, did, nevertheless, by permission of his liege lord, make over the village of *Mayúra-pura*, whose revenues were received by himself, in the district of *Khadga-kúpa*.

Likewise, the young prince, the blessed JAYA-SRÍ-RÁJA, religiously bestowed on HARSHA-DEVA, the village of *Koli-kúpaka*, whose revenues were received by himself.

Likewise, by SÁKAMBARÍ, whose husband was the blessed HARMAHATA, the whole of [the villages called] *Lavana*, *Kútaka*, *Prativinsa*, and *Apaharshaka*, was bestowed in the same manner.

Likewise, by a lady named TA'VIKA, one village, in a northern direction, was given through divine love to SRÍ HARSHA.

Let us behold likewise, here, the lands bestowed by holy-minded personages, the revenues of which are now enjoyed by the gods - - - - - - - - - - - - - the shade of holy pippila trees in a beautiful hamlet - - - - - - - - - - - - - - - - causeway to those who approach the sacred soil of HARSHA - - - - - - - - - - - - - - - -

Notes on the preceding Inscription.

I.—This verse is in a hendecasyllable measure, called *Ratha-udgatá*, of which an exact idea may be formed by one accustomed to the harmony of classical numbers, from the following slight transposition of a line in the Œdipus Coloneus :

— ⏑ — ⏑ ⏑ — ⏑ — ⏑ —

Νὺξ ἐπ' ὄμμαοι βέβηκ ὀ λεθ ρι α

four of such lines forming a verse.

The two first lines are somewhat indistinct on the edge of the stone; and in the second of them, there might be some considerable doubt as to the syllables ज्य या and तेा, were not the others connected with them (particularly the शिव सि and वम्) so clearly marked as to admit no reading consistent with both metre and sense, beside the one here adopted, which is in strict accordance with the Indian notions of metaphysical theology. The अस्तिता is here *οὐσία* or abstract essence, antecedent to qualities of any kind, of which the Hindu theosophists can discourse as subtly and as unintelligibly as PLATO in the Parmenides. Such is exclusively their notion of Deity as existing prior to the developement of the ternary forms or qualities, first in the Supreme Triad [BRAHMA', VISHNU, SIVA,] and next in the several orders of created beings: this first immaterial substance being the neuter ब्रह्म *brahmă* of the Upanishads and the Vedant—the पुरुषः or *male* inactive principle of the rival Sankhya school—the ΒΥΘΟΣ or unfathomable depth of some of the Gnostics, who attempted the introduction of these eastern metaphysics into Christianity. All these schools teach that the immaterial essence of the one all-pervading Deity is no otherwise connected with the diversities of created existence, than through an independent feminine principle: which in the Vedantic system is MA'YA' माया, or illusion;—but मूलप्रकृति: or Radical Nature, the *female* parent of all, in the Sankhya system,—and ENNOIA in that of the Gnostics, (in which, as in the Sankhya, ΝΟΥΣ or *Intellect* बुद्धि: otherwise called महान is the first-born offspring, and then all separate individual essences.) Now this common mother of the external world (संसार) is identified in the mythological part of Hinduism, with SIVA', or DURGA' AMBIKA', the consort of SIVA. This identification is the principal subject of that celebrated section of the Markandeya Purána, called the *Chandipatha*, or *Devi-mahatmya*; and is thus expressed by the great SANKARA A'CHA'RYA himself, in the first verse of his famous hymn to this goddess, entitled, *A'nanda-laharî*, (by which he sought to atone to the mother of External Nature, for his efforts as a Vedantist, to lead his disciples from her illusions and fancied diversities, to absorption in the one essence of abstract Deity).

शिवः शक्त्या युक्तो यदि भवति शक्तः प्रभवितुं
न चेदेवं देवो न खलु कुशलः स्पन्दितुमपि।
अतस्त्वामाराध्यां हरिहरविरिंचादिभिरपि
प्रणन्तुं स्तोतुं वा कथमकृतपुण्यः प्रभवति॥

"If SIVA be united to his energy (his spouse SIVA), he is able to exercise dominion; if not, the god is utterly unable even to move. Wherefore Thee, the goddess who art worshipped by VISHNU, SIVA, BRAHMA', and all other beings, what unholy person is competent to adore and praise?" That the same reason should be assigned by the philosopher here for SIVA and the rest of the triad adoring his consort, (agreeably to the Chandipatha aforesaid, especially the 1st and 4th and 12th books,) which is on this inscription, made a reason for SIVA being adored by *her*, viz. his nearer approach to abstract essentiality—will surprize no one who has studied the genius of paganism. The former is the *Sáktya* conclusion; the latter that of the *Saivas:* among whom also, as we may observe in this and the 6th verse of the inscription, SIVA has the properties of the other two members of the triad, that of Creator and Preserver ascribed to him, as well as his own.

The efforts of the human mind, at any time, to escape the metaphysical difficulties that attend the connexion of Mind and Matter; and the yet more serious kindred difficulty, the origin of evil; will never want interest in the eyes of the deeper observers of our nature, its capacities and its destinies. We cannot wonder that in the darkness of unaided reason, men have been almost universally led to interpose some independent existence, some TAH, the source alike of Nature and of Evil, between the creature and the Creator. But it is more extraordinary, that at the present day, SANKARA A'CHA'RYA, and the Vedantists, whose mode of meeting the difficulty is by maintaining external Nature to be illusion, and the perfect identity in real essence, of all human souls with the Supreme, should be represented by any as *reformers* of Hinduism, and as attached to that only true theology, by which the Supreme Being is recognized, in the words of Sir ISAAC NEWTON, *non ut anima mundi, sed ut universorum Dominus.* However natural be the desire in some, to unite the profession of the most venerated school of Hindu religion with the boast among Europeans of a pure and enlightened creed, the attempt to conciliate things so dissimilar, and even opposite, as these, cannot long consist with any accurate knowledge or study of either.

II.—The second verse is in the free, but harmonious measure of the *Anustubh* class, (i. e. of eight syllables)—first unconsciously struck out, as it is said, by VA'LMÍKI, the HOMER of India, on witnessing the cruel act of a sportsman.

मा निषाद प्रतिष्ठां त्वमगमः शाश्वतीः समाः ।
यत्क्रौञ्चमिथुनादेकमवधीः काममोहितम् ॥

Upon which, struck with the beautiful cadence of his own improvisation, he composed the Rámáyana in similar verses.*

* An account of this measure is given by COLEBROOKE, in his Essay on Sanscrit and Pracrit Poetry, and by M. CHE'ZY, (Essai sur le Sloka.) The following will be found, I believe, a more complete statement of its rules than either. Each *páda*, or quarter, (of which the last syllable is ever accounted common,) consists of two qua-

The first quarter of this verse is obliterated on the edge of the stone, and it would be idle to attempt its restitution.

III.—This verse is like the first, a lyric measure, but of a different kind, called *Srag-dharâ*, each of the four lines being of the enormous length of 19 syllables, disposed exactly as in the following (transposed from the end of the Orestes)—with the cæsura on the 14th syllable,

— — — — ⏑ — — ⏑ ⏑ ⏑ ⏑ ⏑ — — ⏑ — — ⏑ — —

Ζηνὸς λάμπροις μελἀθροις δε πελάσω Ἑλένην, ἔνθα σέμναις πάρεδρος

The subject of this verse is the infuriate dance of SIVA, as BHAIRAVA, after the sanguinary vengeance he exacted for the death of his self-devoted wife SATÍ, (the first form of the great DURGA'—as the mountain nymph UMA' PA'RVATÍ was the second,) as related in the Siva-Purâna, &c. &c.

IV.—The measure of this verse is a kind of reduction of the former to 15 syllables, and is called *Manda-ákrantá*.

— — — — ⏑ ⏑ ⏑ ⏑ ⏑ — — ⏑ — — ⏑ — —

Ζηνὸς δ'οἴκοις πελάσω Ἑλένην, ἔνθα σέμναις πάρεδρος

For these descriptions of the god, see MOOR's Hindu Pantheon, under the head SIVA.

V.—This and all the following verses as far as ver. XVI, (with the exception of the IX., XI., and XV., which resemble the II.) are in the same measure with the III. verse, the *Srag-dharâ*.

On the Ganges flowing from SIVA's head, vide MOOR ut sup.—The *threefold* Ganges—the river of heaven and hell, as well as of earth—is a frequent subject with the poets of India.

Of the last word चोरिकाया: which is very clearly marked on the stone, I can make no better sense than that which I have expressed, viz. connecting it with खेला "the sport *of a cricket.*" Perhaps the word may have some other meaning, which the standard vocabularies do not contain.

VI.—नगकनी. The inscription apparently has नगकनी, which is without meaning: but as the न in this ancient Devanagari might easily, by the erosion of a slight loop, pass into a ग, and as "the daughter of the mountain" is a Hindu poetical expression for a *river*, I have read it accordingly.

In this verse, of which both the sentiment and expression are of a higher order than in most others of the inscription, we have the doctrine,

drisyllabic feet. The former of these is subject to no other restriction than that it must not have both the middle syllables short; and in the even quarters. i. e. the 2nd and 4th, it must not close with an Iambus. The latter is more restricted: in the even quarters, it is always without exception a Dijambus, ⏑ — ⏑ —, and in the two others, the 1st and 3rd, it should be an Epitritus quartus ⏑ — — —: except that after a long syllable, the following four forms are sometimes admitted, the first most frequently, the rest more rarely in the order of their position.

⏑ ⏑ ⏑ —
— ⏑ ⏑ —
— — — —
— ⏑ — —

well known among us as the Platonic, of the Universe existing in archetype as *ideas* in the divine mind, before the material creation; in the words of our Spenser,

What time this world's great Workmaister did cast
To make al things such as we now behold,
It seems that he before his eyes had plast
A goodly paterne, to whose perfect mold
He fashioned them, as comely as he could,
That now so faire and seemely they appeare
As nought may be conceived any where.

That wondrous paterne, wheresoere it bee,
Whether in earth laid up in secret store,
Or else in heaven, that no man may it see
With sinfull eyes, for fear it to deflore,
Is perfect Beauty, which all men adore:
Whose face and feature doth so much excell
All mortal sense, that none the same may tell.

Or as in the remarkable lines in BOETHIUS, (Consol. Phil. lib. 3,) which embody the whole doctrine of the Timæus on this subject, the generation and also the destruction of the material world.

Tu cuncta superno
Ducis ab exemplo; pulchrum pulcherrimus ipse
Mundum mente gerens, similique in imagine formans;
— — —
Tu causis animas paribus vitasque minores
Provehis, et levibus sublimes curribus aptans,
In cœlum, terramque seris; quas lege benignâ
Ad te conversas reduci facis igne reverti.

The transition of the ideas of the Divine mind into separate individual intelligences (from which APULEIUS and others derive the whole theory of Polytheism)—the propagation of various orders of beings from these, down to the grossest and most material; and the destruction of the world by the absorption of the lower in the higher existences, till all is lost in the Supreme—are points in which the Hindu schemes (as partially unfolded in the present verse) wonderfully coincide with Platonism. They are parallel corruptions of one great original truth, which in the quotations here given, appears with scarcely any mixture of error.

VII.—XII. The local legend in these verses has been already mentioned. The destruction of "him of the incomparable arrows," the Hindu God of Love, thence called ANANGA, or ATANU, the Bodiless One—as alluded to in the turgid and somewhat obscure expression of the VIIIth, is a favorite subject with the poets of India, and is told at large by CALIDA'SA in the 3d book of the *Cumára Sambhava*. An equivoque seems intended in the first line between one of these names of CA'MA, and the adjective अतनु "large or immense:" but as the former meaning would involve an insipid repetition, it is discarded in the translation.

X.—Nothing is told respecting the *Súra,* or Hero, who is the speaker of this flowery verse.

XIII. This celebrated family is here distinctly called चाऊमान, but चाऊवान, or *Cháhuvána,* in the monuments quoted by WILSON, whence the Hindui term Chowhán, as used by Colonel TOD in his great work on Rájsthán. Allowing 30 years, which is perhaps not too much, for each descent from the father to his first-born son, the following will be the estimated dates of accession in this branch of the family. (None of its six names are to be found elsewhere, in any published monument within my knowledge.)

	A. D.
GU'VAKA, ... became king probably about	800
CHANDRA RA'JA, ...	830
GU'VAKA	860
CHANDANA, ...	890
VA'KPATI, (conqueror of* TANTRAPA'LA), ...	920
SINHA RA'JA, ...	950
And his successor (not by natural descent,)	
VIGRAHA RA'JA*, ... certainly about	968

so as to satisfy the two dates of the inscription.

XIV. In this verse, the last part of which is somewhat involved in expression, I have given the best sense in my power to the enigmatical compound तामरांशुः: *aqueis-radiis-ille.* The Hindus are in the habit of ascribing showers to solar influence, agreeably to the line in MANU, (iii. 76).

आदित्याज्जायते वृष्टिर्वृष्टेरन्नं ततः प्रजाः

or (as it is stated with greater physical truth in the older cosmogony of the Vedas,) to the joint operation of MITHRAS (or the Sun) and the Ocean.

मित्रं वयं पूतदक्षं वरुणं च । रिशादसं धियं घृताचीं साधंता ॥

"I invoke MITRA of pure might and VARUNA not passable by foes—both producing showers that water the earth." *Rig-Veda-Sanhitá,* I. 1. § 1. hymn 2.

XVI. XVII. In these two historical verses, between which we find once more interposed the words पूरस्येदं "*Herois hoc,*" with what precise meaning, I cannot tell—the metre is changed from the alternation of *Srag-dharà* and *Anustubh* stanzas, to the most popular and harmonious of all the very long lyric measures, viz. the *Sárdúla-vikríditam,* consisting of four lines of 17 syllables, like the following transposition from Sophocles.

— — — ⏑ ⏑ — ⏑ — ⏑ ⏑ ⏑ — — — ⏑ — — ⏑ —

Τὰν σὰν, Ζεῦ, δύναμιν τις (ενθαδε παρων) ἀνδρων κατά-σχοι βί ᾳ

* This prince can scarcely be supposed to belong to the PA'LA princes of *Gaura;* but was most probably an ancestor, or near relative, of the northern kings of the same termination, who encountered the earliest Musulman invaders of India. The name of TANTRAPA'LA is not found in any of the lists of PA'LAS supplied from several monuments, by Prof. H. H. WILSON, (A. R. XV. 464.)

XIX.—This verse is in the same measure, but preceded and followed by an *Anustubh*, resembling verse II. There is a considerable obscurity in this stanza, arising apparently from the author's unwillingness to detail the misfortunes of a prince whom he had just celebrated in the two preceding verses, as the first benefactor to the *Harsha* temple, and whose actual victories over surrounding enemies appear evidently to be the subject of the first three lines of this. But as the relative येन in the second line thus evidently relates to king SINHA RA'JA, the तत् at the beginning of the fourth must, by the ordinary rules of construction, refer to him also; (however we might be inclined, from the juxta-position of correlative terms, to apply it to the imprisoned foes of the line preceding:) and consequently he who thus imprisoned others must, after some unrecorded and most unexpected reverse, have needed liberation himself. This is effected, as it appears, by a more powerful monarch, a child of the Sun. Yet no mention is made afterward of the liberated king as acting or reigning: only the acts of the liberator VIGRAHA RA'JA are recorded, and by him the place of SINHA RA'JA is said to be supplied, as though the latter were dead, or in hopeless exile. The truth, as collected from these obscure hints, appears to be, that VIGRAHA RA'JA conquered the kingdom, and restored the family of his predecessor to their former wealth and dignity, after their head had been deposed or carried away captive by others. For it is observable, that two sons of SINHA RA'JA occur in the list of benefactors to the temple after VIGRAHA RA'JA, though without any royal dignity attached to their names; while the latter's alliance to their house seems equally clear from verses XXVI. and XXVII., including him and his brother DURLABHA in the royal genealogy that had been traced from verse XIII.

XX. तुष्टुवेवासवेपमः. The position of the perfect participle of ष्टु in the beginning of this compound, as an epithet of VA'SAVA, or INDRA, is somewhat unusual; but all difficulty as to its meaning is removed by a reference to the legend in verse VIII. The conqueror VIGRAHA, in his pious devotion to HARSHA-DEVA in this mountain sanctuary, is compared to the Indian JUPITER at the head of the celestials, who first adored SIVA under that name, on the same spot of old.

XXI.—This verse is in a favorite measure of 14 syllables, called *Vasanta-tilakam*.

— — ⏑ — ⏑ ⏑ ⏑ — ⏑ ⏑ — ⏑ — —

τὰν σὰν ἔπ ει τα δύ να μιν τις ἀ νὴρ κα τάσχοι;

The construction is very involved, but in a degree not unusual in Sanscrit poetry; and is unravelled by appending the whole severally to three principal words, येन *a quo*, निजराज्यलक्ष्मीः *proprii-regni-fortuna*, ईरिता *compellata (est)*. The first, referring of course to VIGRAHA, has for its epithet the participle दृप्ता *dante*, to which belongs the accusative चिरसन्निवासं *dinturnum-domicilium*. The second has for its epithets the participles of the first and second lines, to one of which चिंतयंती,

cogitans, belong the words संप्रति विभुर्ननु को मम "*jam dominus equidem quis mei?*" for the connecting particle इति immediately following, marks this as the subject of thought. The third, which alone of the participles has the force of a passive verb, denotes the answer which the personified Fortune receives to her questioning thought in the second line: and here the connecting particle इति, which indicates the answer, though most awkwardly separated from it, refers undoubtedly to the words in the third line following येन, viz. उच्च बाहुयुगले "*Habita (in) brachiorum ζύγῳ.*" The most unusual part of the sentence, however, is the junction of the word संधि *(pax)* with this leading participle in the compound संधीरिता, which can mean nothing else than *pacificè-compellata.* The stress laid upon this circumstance of *pacific* answers and protection, seems to confirm the opinion, that VIGRAHA entered the kingdom originally as a conqueror.

XXII. XXIII. The measure of these two verses is the same as that of the 1st, the *Ratha-udgatá.*

XXIV. And here we return to the long measure of the III. V. and following verses, the *Srag-dharà.*

The word तिरि, whose instrumental plural occurs in the third line, is inexplicable from any existing vocabulary, or oral information within my reach. As no probable emendation occurs to me of what is thus clearly marked in the inscription, I can only give it the sense of the word most nearly approaching to it, (तिर्यच्) and suppose that the compound समानस्थलकुलतिरिभिः means, like समानस्थलकुलतिव्योम्नः "with *birds* of every place and tribe."

XXV. This and the seven following verses are like the II. &c. in the *Anustubh* measure.

XXVI. The prince DURLABHA, thus honourably mentioned as little inferior, or (as the second comparion might indicate,) even superior, to his victorious elder brother, may not impossibly be the prince of that name who reigned at Guzzerát, separated only by a single short reign from CHAMUNDA, who was conquered by MAHMUD GHAZNEVÍ, in 1024: as his elder brother is yet more probably the chief commemorated in a Benares inscription of 150 years later date, as the founder of the fortunes of the Rahtore family, that possessed themselves of the imperial throne of Kanoj about the same period*. The latter hypothesis, which agrees with the history and probable origin of the Rahtore family, requires for its verification, that we allot an interval of 33 years, or a few more, (instead of 24,) to the four generations that separate the Rahtore chief YASOVIGRAHA from GOVINDA CHANDRA, sovereign of Kanoj, (grandfather of the last king, JAYACHANDRA,) of whom we have a grant of land dated Samvat 1177, or A. D. 1120, i. e. 148 years after the date of the

* Whether the VIGRAHA RA'JA DE'VA, who is commemorated as a great conqueror in the 5th Devanagari inscription on the great Lath at Dehli, (A. R. vol. i. Art. 21.) may not be identified with our VIGRAHA RA'JA,—there are no sufficient data for ascertaining.

present monument. [As. Res. vols. ix. and xv.] The former hypothesis, notwithstanding the greater distance of time, derives some plausibility from the comparison of what the Ayín Akbery states concerning that Guzzerattee prince who is there truly called DURLABH, with the larger details of others. It is stated by ABUL FAZL, that MAHMU'D having, in A. H. 416, or A. D. 1025, conquered CHAMUNDA, son of MU'LA-RA'JA, king of Gurjarastra, or Guzzerat, (who was connected by the father's side with the princes of Dehli, but whose maternal grandfather and predecessor on the throne was descended from the Kanoj kings,) took a prince of the same house, who is called in his catalogue DURLABHA, prisoner with him to his own capital, at the request of another of the family, (called there BEYSER, perhaps VATSARA, but by others VALLABHA,) whom he left viceroy in Guzzerat, and who dreaded the ambition and martial ability of his kinsman. Afterwards, at the request of the same person, who had secretly provided what he thought a more secure prison for his dreaded rival, DURLABHA was sent back to the new king, who going out to meet with treacherous professions the kinsman whom he purposed to immure in a dungeon, accidentally lost his eyes; and was on that account deposed by his subjects in favour of his intended victim. FERISHTA, who tells the same history at much greater length in his Mahomedan History of India, (BRIGGS, pp. 76—82,) and moralizes on the retributive close of it, gives to both of these kindred princes, to VALLABHA as well as DURLABHA, the name of DA'BSHELI'M. Now of this last appellation, the name in the *Anvári Soheily* of the Rája for whom those popular stories were recited, (which originating from the Sanscrit *Pancha Tantra*, after successive Pehlevic, Arabic, and other translations, have become so well known in Europe as the Fables of PILPAY,) we may observe that it is as naturally applied by a Persian to any Indian prince who can be made to bear it, as the name of HERCULES by a Roman to any great foreign conqueror, or ULYSSES to any wanderer in unknown regions. In this case, where DURLABHA and DA'BSHELÍM are scarcely more unlike in sound than ODIN and ODYSSEUS*,—it is not wonderful that the name should have been so applied by the Mahomedan invaders, men of much less critical judgment in these subjects than the historian of ancient Germany; and to justify the application of the same name to VALLABHA, it is not extraordinary, considering their strong attachment to ethical stories of this kind, that they should have converted the last-named prince into something like his imagined prototype, a man of eminent wisdom and virtue, living in contented poverty notwithstanding his royal descent, until sought out for this viceregal honour by the Musulman conqueror—like him on whom ALEXANDER bestowed under nearly the same circumstances the conquered kingdom of Sidon. FERISHTA indeed acknowledges, that this account of MAHMU'D's viceroy was doubted even in his time; and that instead of a hermit, he was represented by many as a cruel and ambitious prince, who had before made several attempts against

* See F. SCHLEGEL, Lect. 6, on the History of Literature.

his brothers and kinsmen; but this account, (though most amply confirmed, as we might imagine, by the sequel of the history as told by FERISHTA himself,) is discarded by the worthy historian in favour of the more exciting account of the elevation of his hermit, "DA'BSHELI'M the Wise," to the royalty that he afterwards so deservedly lost. To the other warlike DA'BSHELÍM, whom the more sagacious minister of AKBER correctly calls DURLABHA, FERISHTA seems to think (p. 77) that the characters of cruelty and ambition more truly apply, notwithstanding the evident justice of his cause at the close: and it is of him that he had shortly before (pp. 70, 71) recorded the formidable but unsuccessful attack upon MAHMUD when besieging Somanáth.

The great objection to the identity of this warlike prince with the DURLABHA of the inscription is, that it involves the supposition of his being 70 years old at the period of this attack on the Musulman invader, and 82 at the close of his own reign in Guzzerat; but this is perhaps not very improbable.

XXIX. पंचार्थलकुलाम्नाये. What is this *Panchárthala* or *Quinquarticular* tribe of bráhmans, to which a particular *ámnáya* or rule of discipline is ascribed, I have not been able to discover. It is evidently contrasted with the contrary rule of a *Sánsárika* or worldly tribe सांसारिककुलाम्नायः mentioned in ver. XXXI.

XXX. तोल्लटः TOLLATA is a most singular name for one descended of a pure race of bráhmans: but it is so clearly written on the stone as to admit of no conjectural alteration. The word द्विर् *twice* is also clearly marked, with the exception of the easily erased *r*, (whose insertion is necessary to prevent the hemistich ending with a triple Iambus, a thing absolutely inadmissible): and to this I have affixed what appears the only possible interpretation. The third quarter of the verse offends against a rule which is scarcely ever found violated in classical writings, by giving two short syllables गटि after the first syllable in the quarter: the proper name VARGATIKA being perhaps the justification of the license. (See note on verse II.)

XXXII. It is a favourite practice of the Hindus to represent their great religious teachers as incarnations of particular divinities. SANKARA ÁCHA'RYA, as it is well known, is considered as an Avatár of SIVA himself, incarnate for the purpose of maintaining Vedism in its spiritualities against the Buddhists and other adversaries, after preceding incarnations had maintained it in the exterior points of caste and ritual duty. And his principal disciples and commentators are equally represented in the 3rd chapter of the *Dig-vijaya-Sanxepa*, that commemorates his conquests, as incarnations of other minor Deities; e. g. the scholiast A'NANDA-GIRI of this same attendant god NANDI', SIVA's chamberlain, (or according to another account, of BRAHMA',) sl. 6, 8. &c. &c.

XXXIII., XXXIV. In these two verses, the long *Srag-dharà* measure of verses III., V., &c. is resumed.

In the latter the epithet चंडांक applied to the mountain, refers to some symbol of the worship of the great Goddess DEVI there. In rendering

the next epithet गगनपथलिह्रेाचगशृंग, the Shakspearean expression "*Heaven-kissing hill,*" appeared more seemly in English than the literal translation "whose extended horn or peak *licks* the path of Heaven."

XXXV. This and the six following verses are again in the heroic measure of the Puránas.

A Naisthika is one who abides perpetually in the duties of the first order of brahmanical life, that of a *Brahmachárí* or religious student, as they are laid down in the 2nd book of MANU's Institutes, without proceeding to either of the other three orders, that of the married householder, the eremite or the mendicant. The second chapter of the *Dig-Vijaya-Sanxepa* above-mentioned, written by SANKARA's eminent disciple MA'DHAVA-A'CHA'RYA, contains a friendly altercation between SANKARA's father SIVA-GURU when a student, and his religious preceptor, in which, while the latter urges the propriety of his accomplished pupil's marriage, the other declares his wish to remain attached to his spiritual father.

श्रीनैष्ठिकाश्रममहं परिगृह्य यावज्
जीवं वसामि तव पार्श्वगतश्चिराय:।
दण्डाजिनेा सविनये बुध जुह्वदग्नी
वेदं पठन्पठितविस्मृतिहानिमिच्छन् ॥ १६ ॥

"I, O sage, embracing the blessed order of a *Naisthika*,—dwell as long as I live, attached to thy side perpetually,—with my pupil's staff, and my pallet of deer-skin, ever meekly submissive, sacrificing with the sacred fire, perusing the *Veda*, anxiously desirous to cut off the possibility of forgetting what I have perused already."

In the second half of this verse (of which the first syllable is somewhat obscure on the stone), a great Vedantic doctrine is contained, which the Uttara Mimánsa and Pátanjala schools practically inculcate, viz. that by the practice of austere meditation on the One all-pervading Essence, and abstraction of the mind from all surrounding objects, to which conclusion self-torture *(Tapas)*, is one introductory step, union is obtained with the eternal Divinity in his (or rather *its)* transcendental primary form, existing independently of that triad of qualities which was emitted for the creation, preservation and destruction of the world. The liberated man *(Mukta)* who is thus absorbed into the essence of deity, and freed from all future transmigration, or recompense of works, whether for weal or woe, is freed at the same time from all respect whatever to the three qualities above-mentioned; i. e. freed from the *purity* (सत् or पुण्य) which preserves, as well as from the *passion* (रजस् or अपुण्य) which creates, and the *defilement* (तमस् or मल) which destroys. This character of the Hindu perfect man (as all the Vedantic writers teach, after the Upanishads or mystical parts of the Vedas), is distinctly contained in the single epithet of our inscription अजातपुण्यापुण्यमलत्रय:

"one in whom the threefold quality* of holiness, unholiness and defilement is unborn or non-existent:" and surely nothing more is required to shew how remote from morality, as well as pure theism, is that pantheistic speculation to which some persons would point as a restitution of the pure religion of ancient India: (though the elementary and heroic polytheism of the other part of the Vedas appears certainly to be much older.)

XXXIX.—प्रपाहरणन्तथा for प्रपाहरणं तथा This is the only instance in the whole incription of a *final* Anusvára being converted to the nasal letter answering to the following initial consonant, whether dental, as here, or guttural, palatine, cerebral or labial; according to the constant custom of Bengal, (observed also in the Mahratta copies of the Vedas, and perhaps some other instances,) which has been scrupulously followed in Col. HAUGHTON'S valuable edition of the Institutes of MANU. In every other instance the inscription follows the rule of the best Devanagari MSS. in retaining the Anusvára: only, (with *many* of these, as well as with *all* Bengal MSS.) always changing the Anusvára to म् at the end of a verse or a hemistich. In the *middle* of words the inscription is inconsistent in this respect, like most Devanagari MSS., sometimes giving the Anusvara, sometimes the special nasal letter, (e. g. चंद्र or चन्द्र, &c. &c.) but more frequently the former. In all these instances, the writing on the stone has been exactly copied by me into modern Devanagari.

XLII.—This verse is in a measure of 15 syllables, called *Máninî*, which is distributed thus.

⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — — — ⏑ — — ⏑ — —

Νέα τάδε κακὰ μοι νῦν ἦλθε μοίρᾳ μαλ' ὄικτρα.

The subject of this verse, as of verse XXXVIII., might probably be illustrated by closer inspection of the ruins and their site.

XLIII. XLIV.—The former of these verses is like the II, in heroic measure, the latter is like ver. I., in the hendecasyllable measure *Ratha-udgatá*. The name of GAYA is perpetuated by the beautiful place in Bahar, that is called after him (only a few miles from the birth-place of the head of the rival religion, GAUTAMA BUDDHA), to which all India resorts for the performance of offerings to deceased ancestors. But why this sainted *Asura* is particularly introduced here, does not appear.

XLV. This verse is in a more ancient description of measure than any of the lyrical ones above described, being independent of the number of syllables, and regarding only their aggregate quantity, like the Dactylic and Anapæstic measures of the Greeks. It is called *A'ryá*, and is composed of two unequal hemistichs: the former consisting of seven *Spondaic* feet, (i. e. each equivalent to two long syllables or four short ones,) and a redundant syllable; with no farther restriction on those feet, except that the first, third, fifth, and seventh, must not be an Amphibrachys ⏑—⏑; while the sixth, on the other hand, must be either an Amphibrachys or a Proceleusmaticus ⏑ ⏑ ⏑ ⏑. The latter hemistich resembles the former in every

* Not "quantity," as erroneously printed in the translation, p. 379.

respect, except that instead of the Amphibrachys or Proceleusmaticus above-mentioned in the sixth place, a single short syllable is there inserted: and both hemistichs are divided into *pádas* or quarters at the end of the third foot, (the last syllable of which is not accounted common as in the other measures.)

धीरनागेन The reading on the stone most resembles धीरनाथेन, to which no good meaning can be assigned—unless by a violent ellipsis we understand it to denote "one whose superior merit *annihilates* all rival *learned men.*" The letters थ and ग being nearly alike in this ancient character, I have little hesitation in reading it as I have done, "the *chief* of learned men." The use of नाग "serpent," as of शार्दूल "tiger," सिंह "lion," &c. &c. to denote pre-eminence, is a known idiom in Sanscrit.

XLVI. The allusions in this elaborate and not inelegant verse, which is in the *Srag-dhará* measure, may be found explained in any treatise of Hindu Mythology. The *sign* of which there is to be "no-removal (अहर) even when the sun is bereft of its splendor (रविअर्क्ष)" should seem to be the lunar emblem of verse XVIII. from which this mountain is called चंद्रांकशिखरः in the second of the records of gift that follow; or it may be the emblem of DURGA', whatever that may have been, which obtained for the same hill the like-sounding epithet of चंडांक in verse XXXIV. The mark by which the mountain is now distinguished from the distance of nearly 50 miles round is, as Sergeant DEAN informs us, of modern structure; but it has probably succeeded to the place of some equally conspicuous sign erected 750 years before by SINHA RA'JA.

XLVII. This verse, which is merely introductory to the first prosaic passage in the inscription, describing the date at which the temple was begun, is the last of the 23 *Anustubh* stanzas.

In the date that immediately follows, the well known abbreviation शुदि *su-di* (for शुक्लपक्षदिने) "the day of the former half," i. e. from the change to full moon, indicates that we are to follow here the astronomical year of the Hindús, in which the moons are adjusted to the solar year (like the ancient Attic system, but in a manner much more complex and artificial), not the ordinary civil or solar year with its calendar months. According to the latter, since the Samvat or Vicramáditya year 1018 (coinciding with 4062 of the Káli-Yuga or 883 of Saliváhana), began on Saturday, the 23rd of March, O. S. A. D. 961, the 13th of its third *calendar* month Ashádha would fall on Wednesday the 5th of June, O. S. in that year. But the commencement of the first *moon*, which we are now to regard, when computed according to the rules laid down by Colonel WARREN in his elaborate work, and followed by Mr. JAMES PRINSEP in his useful compendium, is found to precede by three days on that year the commencement of the civil month called by the same name Vaisákha; it fell on Wednesday the 20th of March before 7h. P. M.; and as no intercalation of moons takes place until the beginning of two fall on the same calendar month, the 13th Tithi or lunar day of the third moon Ashádha would thus fall within the 7th of the civil month so called, i. e. Thursday the 30th of May, O. S.

A. D. 961 [or if corrected according to the right astronomical position with respect to the equinoxes, as fixed afterwards by the Gregorian calendar, Thursday the 4th of June, 961.] To the other abbreviations beside शुदि, some of which are worn and indistinct, I am unable to assign any meaning.

XLVIII.—This verse, the last of the 15 *Srag-dharà* stanzas, (which constitute about half of the poetical part of the inscription,) is extremely valuable for fixing by a definite circumlocution the number of the year, 1018, and thus securing from all suspicion of mistake the somewhat worn numbers of the figured date that preceded. But here its *close* coincidence ceases: for while the prose date is the *thirteenth* of the former half of Ashádha, which must have been either the Thursday aforesaid, or the Friday next following,—that of the verse is Monday, the *third* Tithi or lunar day in the former half of some month not named: (for though the greater part of the word तृतीया is erased, it were impossible to read चतुर्दशी or any other ordinal numeral in its stead.) Now, though one condition stated in the verse appears incompatible with this lunar month being Ashádha, viz. the Sun's having entered or at least approached the sign Leo, which it could not enter till long after the fourth quarter of that moon,—I still think that the 3rd of the 1st quarter of the *A'shádha* moon, which fell on a Monday, is the date here intended; for by placing it later we should not only fall on a different day of the week, but admit the absurdity of making the commencement of the work, as stated in the prose and in verse XLVII., prior to the divine command for undertaking it: whereas now the alleged command precedes the commencement of the work by the probable interval of ten days, viz. from the 3rd to the 13th of Ashádha, or from Monday the 20th of May O. S. A. D. 961, to the Thursday week following.

[It should be remarked that the word गते, on which the above difficulty turns, is very indistinct on the stone, and indeed more resembles यते or पते which are unintelligible: though the compound word सिंहराशौ "in the sign of Leo," is not to be mistaken.]

Here begins the enumeration of donors and benefactors to the temple; preceded by a date which marks the conclusion of the work, as the former marked its commencement. Pursuing the computation, it is found that the first moon of the Samvat year 1030 preceded the civil year by nearly half a month, commencing on Friday the 7th of March, O. S., A. D. 973, while its full moon (the Paschal full moon of the Christian year) fell very early on Saturday the 22nd of March: and that of the third moon Ashádha, which is the close of its 15th lunar day here specified, falling consequently just 59 days after, that lunar day itself will coincide with Monday the 19th of May, O. S. (or May 24th according to the Gregorian calendar) the same year*.

* To give a notion of this, which is the date of the inscription itself, from contemporary events in the West,—it may not be without interest to observe, that it is later *by* 12 *days* than the death of the Emperor OTHO I., the greatest man on the continent of Europe since CHARLEMAGNE, and in SISMONDI's judgment, his superior in many respects; whose memorable conquest of Italy occurred at the former date, viz. A. D. 961,

The first benefaction has its date assigned to the beginning of October, without naming any year; it may be A. D. 961 or some later year of the reign of SINHA RA'JA. That the word यूक means the sign of Libra, though not to be found in that sense in any lexicon, is shews in the following *A'ryá* verse of the *Sat-kritya-muktávalí* of RAGHUNATHA, well known to the astrological students of India,

क्रियताबुरिजितुमकुम्भीरलेयपाथेययूककौर्याख्या।
तौचिक आकोकेरो हृद्रोगश्चान्त्यभं चेत्थं॥

on which the scholiast writes इति मेषादीनांविशेषसंज्ञाः "such are the special names of *Aries* and the rest of the Zodiacal signs," i. e. *Kriya* is for Mesha ♈; *Táburi* is Vrisha ♉; *Jituma* is Mithuna ♊; *Kulíra* is Karkata ♋; *Leya* is Sinha ♌; *Pátheya* is Kanyá ♍; *Yúka* is Tula ♎; *Kaurpa* is Vrischika ♏; *Tauxika* (as if from Τοξον) is Dhanus ♐; *A'kokera* is Makara ♑; *Hridroga* is Kumbha ♒; and *Antyabha* is Mína ♓.

In the 2nd grant, I cannot be sure that I have rightly divided the names of the villages, or even in every instance that I have exactly discriminated proper names, (e. g. *Uru-saras* which means "a wide tank,") while the topography of the country and even the names of its *Vishayas* (districts or pergunnahs, as they are called since the Mahometan conquest,) are unknown to us. But from this general uncertainty of the proper names in this paragraph, we must of course except the still celebrated resort of pilgrims, *Pushkara*, or *Pokar*, situated about 150 miles S. W. from this mountain, and four miles west of Ajmeer, on a beautiful lake पुष्कर from which its name is derived.

The 3rd grant, made by VATSA was undoubtedly during the reign of his brother SINHA RA'JA, as appears by its being placed before the gift of the two villages, *Chhatradhára* and *Sankaránaka*, by the new king VIGRAHA, repeated here as the 4th grant, after having been recorded in the metrical part of the inscription. This proves what has been before remarked, that the 5th grant by the two sons of SINHA RA'JA was subsequent to the accession by conquest of their protector VIGRAHA RA'JA. The word संख्यानं, *enumeration*, in this record, means the specification of year, month, half-month, day, caste, family, and parentage, as prescribed in the text of YAJNAVALKYA.

समामासतदर्द्धाहर्नामजातीखगोचकैः।
सब्रह्मचारिकात्मीयपित्रनामादिचिह्नितम्॥

See *Mitáxara*, sl. 87—where, in the commentary, the above-enumeration is called संख्या.

Of the decease of OTHO the Great, which took place in 973, some remarkable particulars are given by cardinal BARONIUS, from an author of that age, named WITICHIND, who states the event to have been "*nonis Maii, quartâ ferâ ante Pentecosten*," i. e. "on the nones or 7th of May, the 4th day (Wednesday) of the week before Whitsuntide," (Annales, tom. x. p. 812.) I quote these words because they minutely confirm the lunar calculation given above: for the Whitsunday of May 11 implies an Easter Sunday of March 23, agreeably to the time deduced above for the Paschal full moon of that year, (Samvat 1030.)

Nothing occurs particularly worthy of mention in the four grants that follow, in which the names of persons and of places are in general marked with very intelligible distinctness, until we come to the final recapitulation beginning with the word पुण्यात्मभिः. After this and a few following words the import of which is very plain, comes an assemblage of names, probably names of places in a great measure; to which, except in parts here and there, I can assign no meaning whatever. The Devanagari letters, which are for the most part sufficiently clear on these two last lines of the stone, are faithfully exhibited in the three lines of p. 384 preceding the concluding verse, for the benefit of such as may be skilful or fortunate enough to discover the clue to their interpretation.

XLIX. This concluding verse is in a hendecasyllable measure called *Sálini* which may be thus represented :—(compare verses III. and IV.)

— — — — ⏑ — — ⏑ — —

Ζηνὸς δὴ λάμπροις ἐνέσται μελάθροις

This verse occurs in the Benares inscription often referred to (A. R. XV. 453)—and as Capt. FELL remarks in his notes, p. 458, in other inscriptions also, and in some, as he was gravely assured by certain pandits, that bore the signature of the mighty RA'MA himself in the *Dvápara Yuga*. It seems to be a general formulary annexed to grants of land, in order to secure respect from the future lords of the soil, and excite them to do likewise. Capt. FELL seems to have read सर्व्वान *all*, instead of सज्ञान् *devoted*, and perhaps रामचन्द्रः RA'MACHANDRA instead of the synonymous रामभद्रः.

III.—*Notice of Pugan, the Ancient Capital of the Burmese Empire. By Lieut.-Col.* H. BURNEY, *H. C.'s Resident in Ava.*

The celebrated Venetian traveller, MARCO POLO, (see MARSDEN'S edition of his Travels, pages 441 to 451,) has given us an account of the war between the Tartars and the people of Mien (the Chinese name for Burmah), which occurred some time after 1272, and led the former to take possession of the then capital of the latter nation. SYMES and CRAWFORD, in the Journals of their Missions to Ava, as well as HAVELOCK and TRANT in their accounts of the late war, have described the extensive remains of Pugan, the former capital of the Burmese empire, lying between Prome and Ava, with its innumerable ruins of temples and columns. Perhaps the following account of the destruction of that city, translated from the 5th volume of the large edition of the Royal Chronicles of the Kings of Ava, (*Maha Yazawen wen dan gyee,*) may be deemed curious. *Pugan*, also called *Poukgan* and *Arimaddana*, is stated to have been founded by a king THAMU-DIRIT, A. D. 107, shortly after the destruction of the *Thorè Khettara* or Prome empire, and the king NARATHIHAPADE, in whose reign the Chinese took possession of the city, was the 52nd from the time of its foundation.

"In the Burmese year 643, (A. D. 1281,) the Talain WAREEROO killed the noble ALEIMMA, who was lord of the city of Mouttama (Martaban), a part of the empire, and set himself up as king there. In the same year, the emperor of China deputed ten nobles with 1000 horsemen, to demand certain gold and silver vessels, on the ground that king ANAURATHA MEN ZAU* had presented them. Some histories assert that they came to demand a white elephant.

"The Chinese envoys conducted themselves in a disrespectful manner in the royal presence, when his majesty ordered the whole of the ten nobles and 1000 horsemen to be put to death. One of the ministers, NANDA PEETZEEN, respectfully addressed the King, saying, 'Although the envoys of the emperor of China are ignorant of what is due to a king, and have conducted themselves in a disrespectful manner, yet if it seemeth well to your glorious majesty, a report of their conduct should be made to the emperor of China. If it pleaseth your majesty to have patience, and issue such orders as may promote the interests of the country, such orders should be issued. To put ambassadors to death has not been the custom during the whole line of our kings. It will be proper then for your majesty to forbear.' The king replied, saying, 'They have treated with disrespect such a sovereign as I am; put them to death.' The officers of government, fearing the royal displeasure, put the whole of the Mission to death, without a single exception†.

"When the emperor of China received the intelligence of the execution of his envoys, he was exceeding angry, and collecting an army of at least six millions of horse and 20 millions of foot, sent them down to attack Pugan; the king of which, NARATHEEHAPADE, as soon as he heard of the coming of this force, placed under the generals NANDA PEETZEEN and YANDA PEETZEEN 400,000 soldiers, and numerous elephants and horses, with orders to proceed and attack the Chinese army. The two generals marched to the city of *Nga-young-gyan*, and after putting its walls, ditch, and fortifications in a proper state of defence, opposed the Chinese army at the foot of *Bamau* river, killing during three months so many of that army, that not a grass-cutter even for its elephants and horses remained. The emperor of China, however, kept reinforcing his army, and replacing those who were killed, by sending 200,000 men, when he heard of the loss of

* This King of Pugan is said to have invaded China about A. D. 1040, and gold and silver flowers or ornaments are the emblems of tributary subjection among all the Indo-Chinese nations.

† There is some kind of tradition at Ava, that the Chinese envoys insisted upon appearing in the royal presence with their boots or shoes on.

100,000 men, and 400,000, when he heard of 200,000. Hence the Burman army was at last overpowered with fatigue, and the Chinese crossed the river and destroyed *Nga-young-gyan.*

"As the *Nats* or spirits attached to either nation were fighting together in the air, four of the Pugan Nats, namely, *Tebathen,* (the guardian of one of the gates of Pugan city,) *Tsalen wot-thaken young Nat, Kan shye young Nat* (guardian of the long lake or tank), and *Toung gye yen Nat* (lord of the foot of the mountain), were wounded by arrows. In the new *Yazawen, Tebathen Nat* is styled *Thanbethen.* On the very day on which the stockade of *Nga-young-gyan* was taken, the *Nat Tebathen* returned to Pugan, and entered the house of the king's teacher, on whom he had always been accustomed to wait. The king's teacher was asleep at the time; but the *Nat* shook and awakened him, and said, '*Nga-young-gyan* has been destroyed this day. I am wounded by an arrow, and the *Nats Tsalen-wot-thaken, Kan shye* and *Toung gye yen* are also wounded in the same manner.' The priest and king's teacher called one of his disciples, a young probationer, and sent him to the king to report the loss of *Nga-young-gyan.* His majesty inquired how this circumstance was known, when the young probationer declared, that the *Nat Tebathen,* guardian of the *Tharabha* gate, had just arrived from *Nga-young-gyan,* and reported the matter to the king's teacher, who had thus learned, that that place had been destroyed on that very day.

"The king then summoned a council of his ministers and officers, and addressed them as follows: 'The walls of the city of *Pugan* are low, and enclose too small a space to permit all the soldiers and elephants and horses to remain comfortably within, and defend them. I propose therefore to build a strong wall, extending from the eastward, from the village of *Balen,* in the upper part of the river, straight down to the southward, taking in the village *Yonatha.* But it is not possible just now to procure bricks and stones quickly; if we break down some of the temples, and use the bricks, we shall be able to complete this wall most expeditiously.' Accordingly, 1000 large arched temples, 1000 smaller ones, and 4000 square temples were destroyed. During this operation, a sheet of copper, with a royal prediction inscribed on it, was found in one of the temples. The words were as follows: 'In the city of Pugan, in the time of the father of twins, the Chinese destroying, will be destroyed.' The king thereupon made inquiries among the royal women, and learnt, that a young concubine had just given birth to twins.

"As his majesty now believed, that even if he built the intended fortification, he would be unable to defend it, he caused 1000 boats

with figure-heads and war-boats, to be made ready, and embarked in them all his gold and silver and treasures; a thousand cargo boats, also, he loaded with paddy and rice; in a thousand state boats he embarked all his ministers and officers, and in the gilded state boats, his concubines and female attendants. But as the boats could not accommodate all the royal concubines and female attendants, who were very numerous, the king said, 'These women and servants are too numerous to be all embarked in the boats, and if we leave them here, the Chinese will seize and take possession of them; tie their hands and feet together, therefore, and throw them into the river.' The king's teacher however observed, 'in the whole circle of animal existence the state of man is the most difficult of attainment, and to attain that state during the time of a Buddha, is also most difficult. There can be no occasion for your majesty to commit the evil deed of throwing these people into the water. Such an act will be for ever talked of even among kings, and will be registered in the records of the empire. Let your majesty therefore grant permission for any person to take such of the royal female attendants as cannot be embarked in the royal boats, and by so doing, your majesty will be said not only to have granted them their lives, but to have afforded them protection.' The king replied, 'Very true,' and set at liberty 300 of the female servants of the interior of the palace, who were taken and carried away by different inhabitants of the city.

"The king then embarked in his gilded accommodation boat, and retired to the Talain city of Bathein (Bassien).

"NANDA PEETZEEN and YANDA PEETZEEN, after the loss of *Nga-young-gyan*, retreated and built a couple of stockades on the eastward slope of the male mountain, where they again resisted the Chinese. Both the generals, holding some *fixed quicksilver** in their mouths, leaped 15 and 16 cubits high in the air at a time, and attacked the Chinese; but whilst fighting in this manner, an arrow, which had been discharged by one of the *Nats* of the two countries, who were contending in the air, struck NANDA PEETZEEN, and threw him to the ground lifeless. In consequence of this event, and the Chinese army being very numerous, victory was unattainable, and defeat again ensued. The Chinese pursued vigorously, and the Pugan generals retreated, keeping their force as much together as possible. On arriving at *Pugan*, and finding that the king and the whole of the population had left that city and fled to the *Talain* country, the army followed them to *Bathein*.

* Among the Burmese alchemists, fixed, or as they call it dead, quicksilver, is an object of great desire, owing to the miraculous power which it is said to confer on the possessor.

"The Chinese continued the pursuit until they reached *Taroup* maur*, but their army, owing to the great distance which it had marched, and its great numbers, began to experience a scarcity of provisions; and was induced to turn back from that place.

"In the Burmese year 646 (A. D. 1284), two *pat* or quarters wanting to complete the 27th lunar asterism, the king NARATHEEHAPADE fled in fear of the Chinese. Hence he is styled *Taroup-pye-men*, the king who fled from the Chinese."

After remaining five months at Bassien, the king, hearing that the Chinese had retreated from Pugan, made arrangements for returning thither. On his way up the river, it is recorded on one occasion, his cooks having been able to serve him up a dinner of only 150 dishes, instead of the 300, to which he had always sat down every day, he covered his face with his hands and wept, saying, 'I am become a poor man.' Shortly after on his arrival off Prome, he was poisoned by his own son, the governor of that place.

The building at *Pugan*, which MARCO POLO calls 'a sepulchre of the king,' must have been one of the large Buddhist temples, containing some relics of *Gaudama*. The body of a deceased king of Ava is usually burnt within the palace enclosed, and the bones and relics carefully collected in some vessel, and thrown into the *Irawádi* river.

Like the early kings of England, named *Rufus*, *Beauclerk*, *Lackland*, *Longshanks*, &c., most of the Burmese kings are distinguished by some *sobriquet* or particular appellation. A king, NARATHU, who was killed by some *Kulas* or natives of India from Chittagong, about the year 1171, is styled *Kula-gya-men*, the king who fell or was killed by *Kulas*. Another of *Toungu* or *Toungugu*, who was taken prisoner and carried away from *Toungugu* to *Syriam*, by the celebrated Portugueze chief, PHILIP DE BRITO and NICOTE, about the year 1612, called *Kula-ya-men*, the king whom the *Kulas* obtained or seized, See Modern Universal History, vol. 7th, page 118.

In the sketch† of the remains of Pugan, the large pagoda on the *proper* right, is called *Ananda*; it was built by a king KYAN-ZEET-THA, who reigned between A. D. 1064 and 1093, and was repaired by the father of the present king of Ava, in 1795, when Captain SYMES visited the place. The pagoda on the high point of land, wasted by the river, is called *Langa Nanda*; it was built by ANAURATHA ZAN, who reigned between A. D. 1017 and 1059.

* Chinese Point, the same as SYMES's Tirroup-mion.

† We regret extremely that the number of plates in the present No. precludes the admission of the sketch to which the author alludes.—ED.

IV.—*Register of the fall of rain, in inches, at Dacca, from* 1827 *to* 1834. *By Dr.* G. W. Lamb.

	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
	in.	in.	in.	in.	in.	in.	in.	in.
January,	..	0.4	0.1	..	..	..	..	1.0
February,	..	0.1	0.1	1.8	3.9	0.7	..	0.7
March,	3.9	0.3	1.0	10.1	4.8	3.6	..	5.7
April,	4.8	1.9	8.1	9.1	7.3	10.2	4.5	5.2
May,	9.1	4.1	11.8	17.7	10.7	6.6	12.4	4.9
June,	12.9	8.4	5.8	10.9	28.6	8.2	5.1	16.0
July,	13.6	9.8	12.0	10.6	8.4	6.6	5.1	5.6
August,	8.1	8.2	8.7	14.6	13.5	17.7	18.6	9.0
September,	18.6	9.7	11.7	6.8	6.6	9.6	12.2	11.2
October,	2 4	3.5	21.5	9.1	5.2	3.5	3.2	6.2
November,	..	..	..	3.2	..	..	1.0	0.4
December,	0 6	0.4	..	..	..	..	0.7	2.1
	74.0	46.8	80.8	93.9	89.0	66.7	62.8	68.0

Dacca, 20th June, 1835.

V.—*Register of the Thermometer at Ambála, for* 1834. *By* M. P. Edgeworth, *Esq. C. S.*

[Having a great many registers of daily observations on hand, for which we have hitherto been unable to find space, we have been obliged to confine ourselves to the publication of monthly abstracts; but we have prepared a copper-plate, in which we hope shortly to exhibit the daily observations both of Barometer and Thermometer for many localities in the same view, and in very limited space.—Ed.]

I have the pleasure of enclosing a register of the thermometer at this place for last year. The temperature during the hot weather is probably considerably too high, in consequence of the situation of the thermometers in the fort town where I then resided; but I hope this year to obtain a fairer estimate, as I have now moved into a bungalow, and the thermometers are placed in the north veranda, very little exposed to glare, &c. Finding that there was scarcely any difference between the means deduced from the extreme temperature during the day and that from the temperature at 10 A. M. and 10 P. M., I have discontinued the latter. For the greater part of the year the maximum and minimum are the extremes, according to the register thermometer; but as frequently I am absent from this place on business in the district, a native (on whose accuracy I can place confidence) registers the temperature at sunrise, and at half past two in the cold, and three in the hot, season, which I have observed to be the hottest time of the day respectively.

Note.—The thermometers used were self-registering ones; that for the minimum with a metal scale by NEWMAN; that for the maximum, with a wooden scale by HAMILTON. They were placed in a niche in a wall facing the north, but exceedingly exposed to glare in the upper (3rd) story of the fort, a large mass of brick, which consequently became exceedingly heated, and was slow in cooling in the hot weather; therefore the temperature stood considerably higher than it would have done in the veranda of a bungalow or house, and cannot be fairly compared with registers made in other places in consequence.

	MEANS.						EXTREMES.						
			Mean temp. of the day deduced from				Minimum.		Maximum		Diurn. variation		
	Mean of minim.	Mean of max.	Mean of max. & min.	Mean 10 A. M & 10 P. M.	Mean of 4 times.	Mean diurnal variation.	Highest.	Lowest.	Highest.	Lowest.	Greatest.	Least.	No. of days on which rain fell.
Jan...	43.24	63.17	53.2	51.4	52.3	23.5	57.	38.5	70.5	56.	27.5	9.	1
Feb...	51.35	70.85	61.1	60.2	60.6	19.9	60.	41.	79.	65.	26.5	8.	5
March,	58.97	81.87	70.4	70.5	70.45	23.	71.	50.	95.	69.	31.	14.	5
April,	67.16	94.63	80.9	80.85	80.87	27.4	82.	55.	111.	80.5	33.	15.	6
May,..	82.5	117.7	100.1	100.0	100.05	35.2	90.5	72.	120.	104.5	37.	25.	1
June,..	83.65	110.1	96.82	96.33	96.52	26.45	95.5	70.	119.	83.	36.	11.5	8
July,..	78.87	96.1	87.4	84.8	86.1	17.3	87.	70.	108.	81.	26.	3.	22
Aug....	78.2	96.88	87.5	86.	86.7	18.6	85.	74.	105.	90.	26.	9.	20
Sept..	77.03	93.2	85.1	84.1	84.6	16.2	84.	71.	99.	82.	21.	10.	14
Oct...	67.33	85.36	76.5	75.2	75.8	18.	78.	58.	96.	69.	24.	5.	3
Nov..	54.03	76.06	65.05	64.3	64.77	22.03	62.	51.	80.	71.	25.	16.	2
Dec...	47.9	65.96	56.93	56.85	56.89	18.06	56.	42.	72.	59.	24.	9.	4
Whole year,..	0	0	76.59	75.87	76.23	22.13	95.5	38.5	120.	56.	37.	3.	93

	No of days on which the wind blew.			
	From W. quarter.	E. quarter.	Both E. and W.	N. or S.
January, ...	22	7	0	2
February, ...	14	12	0	2
March, ...	17	14	0	0
April, ...	19	7	3	1
May, ...	14	5	12	0
June, ...	3	9	16	0
July, ...	2	28	2	2
August,.....	5	16	10	0
September, ...	11	15	4	0
October,.....	16	14	1	0
November,..	27	3	0	0
December, ...	19	7	2	8
Total,..	168	147	50	10

By W. quarter is to be understood from N. W. to S. W. inclusive.

VI.—*Proceedings of the Asiatic Society.*

Wednesday Evening, 5th August, 1835.

The Honorable Sir EDWARD RYAN, President, in the Chair.

Mr. C. BINNY, proposed at the last meeting, was balloted for, and duly elected a Member of the Society.

The Secretary read the following reply from Government, to the application made, in conformity with the resolution of last meeting.

To the Honorable Sir EDWARD RYAN, Knt.
President of the Asiatic Society.

HONORABLE SIR,

I am directed by the Governor General of India in Council, to acknowledge the receipt of your letter, communicating the request of the Asiatic Society, that the whole of the Oriental Works, the publication of which, at the expence of the Fund for Education, has lately been discontinued by order of Government, and those that have been reserved by Government for completion, may be made over to the Asiatic Society, with a view to their completion, at the expence and under the superintendence of the Society.

2. The Governor General in Council is glad to accede to the wishes of the Society, and the necessary Instructions will be issued to the General Committee of Public Instruction, to transfer the publications accordingly.

I have the honor to be, &c.

Council Chamber, the 15th July, 1835. (Signed) G. A. BUSHBY, *Secretary to Government.*

Referred to the Committee of Papers, who will take measures for the receipt and accommodation of the Books, and for the immediate continuation of the works now in the press. Resolved also, that a book of subscriptions be circulated among the members, with a Prospectus specifying the price of each work.

Read the following letter from the Honorable Mr. GEORGE TURNOUR, of Ceylon, acknowledging his election as an Honorary Member.

To the Secretary to the Bengal Asiatic Society, Calcutta.

SIR,

I beg to express my gratified acknowledgments for the honor conferred on me by the Bengal Asiatic Society, in electing me an Honorary Member of their Institution.

Highly as I should, at any time, and under any circumstances, appreciate this compliment, I consider myself peculiarly fortunate in receiving it, at a time when I am engaged in the translation of a valuable historical work in the Páli language. In addition to the data from which the "Epitome of the History of Ceylon," (published in the Local Almanac for 1833, and presented to your Society by the Right Honorable the Governor,) was compiled, this work contains, besides detached historical fragments, a *chronologically connected* Buddhistical History of India, from B. C. 590, to B. C. 307.

It is within that interesting period, that the invasion of India, by ALEXANDER, and the Embassy of MEGASTHENES to Palibothra, took place; which in their results formed the earliest connecting link between the Histories of the East and West.

The account given in the commentary on his work, by the Páli historian, of the Indian monarch of that period, "CHANDAGUTTO," closely resembles JUSTINUS' sketch of that usurper's character under the name of "SANDRACOTTOS."

In point of time also, this Páli History accords with the Chronology of the Histories of the West, with considerable accuracy. The reigns of ALEXANDER and SELEUCUS NICATOR comprised the period from about B. C. 336, to B. C. 280, according to the latter authorities; while the Páli historian assigns to the reign of their contemporary "Chandagutto," the period from B. C. 385, to B. C. 351.

The valuable information brought to light by the researches of Mr. HODGSON and M. CSOMA DE KÖRÖS, and published in your Journal, in reference to Buddhism, will be confirmed, or further elucidated, by this more ancient authority, on several important points.

After the disappointments which have hitherto attended the labor of orientalists in their search for historical annals, *comprehensive in data* and *consistent in their chronology*, a translation *alone* of a Páli History of such extensive pretensions, would be justly received with repulsing scepticism, as to its authenticity, by the literary world. I have therefore decided on publishing the *text also* in Roman characters, pointed with diacritical marks. The entire work will occupy, with its supplementary notes and explanations, about 1200 pages of quarto. As the publication however is undertaken entirely at my own expence, and possibly official demands on my time may prevent the early completion of the whole work, the reception the first volume may meet with, and other circumstances, over which I can exercise no control, will hereafter decide whether I proceed beyond that volume.

While this quarto is in the press, a few copies in octavo of the early chapters are also in progress of being printed for me. These, I purpose, in a few weeks, to distribute among the Literary Societies, prefixed to copies of the "Epitome."

I invite the Members of the Asiatic Society, who have done me the honor to associate me with them, to enter upon a criticism of this work. I allude not to the translation (for the disadvantages or advantages under which I perform the unpretending task of translating, will be undisguisedly stated): but on the original work. If, as I believe, it will stand the test of that scrutiny, the foundation, I conceive, will then be laid for the development and adaptation to chronological order, of a vast mass of historical data, connected with India, which are now scattered in detached fragments amongst the voluminous religious Páli records still extant in this island; and I trust also, that the attention of orientalists will thereby at last be directed to the examination of the Páli works so often alluded to by Colonel TOD and others, as being still in existence in the Rajput and other western divisions of India.

I remain, &c.

Kandy, 10th July, 1835. GEORGE TURNOUR.

Several Members present expressed a desire to possess Mr. TURNOUR's work, and 12 copies were at once subscribed for. The communication was referred to the Committee of Papers, to consider how the objects of the author could be best promoted.

Read a reply of the Bishop of Cochin China, to the Secretary's letter, dated 2nd April, forwarding a portion of the MSS. Dictionaries prepared by him for publication. Referred to the Committee of Papers.

The Secretary intimated the completion of a revised catalogue of the Society's Library, of which copies were distributed to the Members present.

Library.

Read a letter from ARTHUR AIKIN, Esq. Secretary to the Royal Society of Arts, &c. acknowledging the receipts of vols. 17 and 18, of the Asiatic Researches, and forwarding for presentation,—

Transactions of that Society for the sessions 1833-34.

The following books were also presented:

Philosophical Transactions of the Royal Society of London, Parts I. and II., for the year 1834—*by the Society.*

Descriptive and Illustrated Catalogue of the Physiological Series of Comparative Anatomy, contained in the Museum of the Royal College of Surgeons in London, vol. 2nd—*by the College.*

The Indian Journal of Medical Science, Nos. 19 and 20—*by the Editors.*

Madras Journal of Literature and Science, No. 8—*by the Mad. Lit. Soc.*

A copy of the Kífayah, a Treatise on the Questions of Muhammedan Law, by Hakím Maulaví ABDUL MOJID, and presented *by the author.*

A collection of Witty Sayings in Urdu—*by Rája Kalikishan Bahádur.*

Meteorological Register for June, 1835—*by the Surveyor General.*

A Lecture on the Vendidad Sádí of the Parsis, delivered at Bombay, on the 19th and 26th June, 1833; also, an Exposure of the Hindu Religion, in reply to Mora Bhatta Dandekara, and, a Second Reply to Náráyana Rao of Satara—*by the author, the Rev. John Wilson.*

The following books were received from the booksellers:

Illustrations of Indian Zoology, from Major-General HARDWICKE's Collection of Indian Animals.

Illustrations of the Botany and other branches of the Natural History of the Himalayan Mountains, and of the Flora of Cashmere, by J. F. ROYLE, Esq. F. L. S., and G. S. M. R. A. S.

Lardner's Cabinet Cyclopedia———Foreign Eminent Men, vol. 1st.

Library of Useful Knowledge———Vaud's Algebraical Geometry.

A cylindric pedestal, containing on its surface the three principal divisions of the year in use in India; viz. the siderial, the luni-solar, and the lunar, contrived to exhibit on inspection the corresponding day of the European Calendar, by revolving rings, was presented *by the Secretary.*

Literary and Antiquities.

Read a letter from Ensign NEWBOLD, forwarding an account of *Sungie Ujong*, one of the states in the interior of Malacca, with statistical information obtained from native sources.

Mr. NEWBOLD also transmitted an original Malay letter from a claimant to the sovereignty of Menangkábowe, to Mr. WESTERHOUT, a gentleman of influence at Malacca, couched in the following laconic terms, and sealed with a signet large enough to cover the whole of the writing, (similar but double the diameter of those published in Plate XII. of the present vol.)

—"The peace of God, &c. &c." "There are three hereditary kings in this world, viz. the kings of *Rúm*, *China*, and *Paggaráyong (Menangkábowe)*. Should you acknowledge my descent, you will answer this epistle."

A description of the Ruins of the Temple of *Harshá Deva*, in the *Shekáwatí* country, by Sergeant E. DEAN, in illustration of an accurate *fac-simile* of the ancient Sanscrit inscription discovered there and taken off by himself, was read; together with a translation of the inscription and notes upon the whole, by the Rev. Dr. MILL, V. P.

[Published in the present No.]

A description of Pugan, the ancient capital of the Burmese Empire, by Col. BURNEY, with a Drawing of the Town, by Mrs. BURNEY, was submitted.

[Published in the present number.]

Physical.

Ensign NEWBOLD transmitted eight specimens of Tin, cast in native moulds, from the principal mines in the Malay Peninsula; also, the crude ore from Salangore and Sriminantí, with a request that they should be submitted to analysis.

[This shall be done as soon as leisure will permit.]

Also a small phial of the *Spoh* or *Upas* poison (*Toxicaria*) used by the aborigines of the interior of Sungie Ujong, to tip their arrows.

A letter from Dr. BENZA, Surgeon to the Governor of Madras, forwarded for presentation, a Geological Sketch of the Neilgherries, (*Nílgiris,*) illustrated by a coloured map, and by a series of specimens of the rocks and minerals of the range.

Duplicate specimens of the Minerals of South-India in the Museum of the Madras Branch of the Royal Asiatic Society, were presented by the Secretary Mr. J. C. MORRIS.

Dr. J. G. MALCOLMSON forwarded by the same opportunity a series of specimens of the Zeolites, from the trap formation in the vicinity of Poona, with notes on the most curious of them; also a specimen of the native Carbonate of Magnesia, now becoming an article of Export from Madras.

[We propose noticing these further after analysis.]

Lieut. W. E. BAKER, Engineers, presented notices and drawings of some of the fossils of the *Dadupur Museum*, particularly the fossil elk, the horse, the hog, the hyena, the buffalo, &c.

From Lieut. H. M. DURAND, Engineers, were also received and submitted, notes on the fossil Hippopotamus of the Sub-Himalayas, with accurate pen illustrations.

[We despair of being able to do justice to the beautiful drawings of these two zealous contributors, but we will do our best to give them early publication.]

Two bottles of Sea-water, one from the Red Sea, the other from the Arabian Sea, were presented by Lieut. A. BURNES, through Lieut. T. FRASER, who on his own part offered for the Society's Museum, a specimen of the genuine Papyrus of Egypt.

The remainder of the fossil bones from the bed of the Jumna, presented by Sergeant E. DEAN, now Superintendent of the Delhi Canal, were laid on the table, with a descriptive catalogue from the donor.

A collection of Insects from Kemaon, presented by Dr. MCCLELLAND, containing many duplicate specimens of the collection formerly procured by the Society from Sylhet, and a specimen of the silk of the Aranea Diadema.

A collection of Snakes from Midnapore, presented by P. CHIENE, Esq.

A specimen of Monoculus, from Burmah, presented by Col. BURNEY, Resident at Ava.

Specimens of Siliceous Tufa in spherical concretions, from the hot springs in Bhotan, were presented by Dr. MCCLELLAND, who furnished the following particulars of their formation.

"They are produced from hot springs in Bhotan, brought to Almorah by the merchants of that country, and sold as *Duck shot*.

"The substance melts before the blue flame of the blow-pipe, with the addition of borax, into a porcelaneous mass. Without borax, it is infusible, nor does it form lime.

"From the above properties, these singular little spherical bodies appear to be silicious tuff, similar to what is afforded by the boiling springs of Iceland.

"Dr. BLACK, as well as KLAPROTH, who long ago examined the Iceland waters, and the small globules of tuff ejected from them, believed the silex to be held in solution by the immense heat to which it was exposed, assisted by the slightly alkaline character of the waters.

"The Iceland waters are propelled with great violence from the earth, at a boiling temperature, to the height of several yards, and with the water the small globular bodies of silex.

"The only other springs that emit siliceous tuff (as far as I recollect) are those of Carlsbad in Bohemia, where the temperature of the water is (I think) 178° Fahr. I am not sure that the tuff is there afforded in isolated bodies, or rather in stalactitic, and coralloidal forms on the basins of the springs.

"I was unable to learn the locality of the Bhotan springs, or their extent."

VII. —*Miscellaneous.*

1.—*Abandoned Oriental Works.*

The unfinished publications of the Committee of Public Instruction, the printing of which was recently suspended by order of Government through fear of increasing their accumulation of *waste-paper*, have been *liberally* (we really consider the gift to be both *liberal* and *valuable*, notwithstanding the danger of being suspected of irony by some members of the Society), and unreservedly placed at the entire disposal of the Asiatic Society. A pledge has been offered that the Society shall incur no risk of loss from its engagement to complete them, although the printer's estimate amounts to upwards of twenty thousand rupees; and although a writer in the *Friend of India*, to whose solid judgment upon all that concerns the interests and opinions of the natives the greatest deference is due, discourages the hope of any patronage, or profit, from sale of the works, among the rich or the learned of the country. Nevertheless, it is to these, and to the friends of oriental literature among our own countrymen, that the Society can alone look for reimbursement. It must be borne in mind, that the Government having made a present of one half or more of these works, the price at which the Society will be able to sell them will be reduced in the same proportion, and that compared with the price of manuscripts, these rates will be exceedingly low. But if indeed the books are held to be worthless and unsaleable, then will the worst fears of Dr. MARSHMAN be realized. To meet this objection, and to satisfy the inquiries of those who might be alarmed at spending their money on waste-paper, the Prospectus published by the Society (and appended to our present number) has collected a few notices on the principal

works, from the pens of those to whose judgment all will be willing to succumb; and among the patrons of oriental literature in the older time, it is gratifying to behold the name of the first Governor General of India. We will not allow it to be imagined, however, that all encouragement has been abandoned in these latter days: it was in 1832-3, that the Tibetan Dictionary and Grammar were printed at a cost of Rs. 5,000 to Government. A proposition for the printing of a Cochin-Chinese Dictionary prepared by the Vicar Apostolic of that country is, we perceive by the proceedings of the Asiatic Society, about to be made. It remains to be seen whether the fatal edict, almost the last of the late administration, will interfere to prevent the patronage of this valuable addition to the languages of the east.

2.—*Burnes' and Conolly's Travels.*

The Geographical Society of Paris have paid a handsome compliment to our travellers, Lieutenant A. BURNES, and Lieutenant A. CONOLLY, in testimony of the value set upon the published results of their adventurous labours. On the latter they have conferred a copper prize-medal, and to the former, one of silver.

The avidity with which interesting works on the newly explored regions of central Asia are received at home, may be judged from the fact, that Lieutenant BURNES' work passed through three English editions in a year, besides a translation into French and German.

3.—*Ceylonese History.*

The Honorable GEORGE TURNOUR of Ceylon, well known for his attainments in the Páli and Singálese literature, is now publishing a translation of the *Mahavanse* or History of the Rájás of Ceylon, from the landing of *Vijaya* on the island in the 9th century before Christ. We refer to the proceedings of the Asiatic Society of the 5th August for some particulars of this costly undertaking, to which we trust due encouragement will be given.

4.—*Valuable Tibetan Works.*

We are happy to announce that Mr. HODGSON, resident in Nipal, has at length been able to procure a complete copy of the *Stangyur* collection, of which only a few extracts were hitherto in possession of the learned, although a catalogue of the contents of the whole collection has been drawn up by Mr. CSOMA, and published (in analysis) in the Journal Asiatic Society. Mr. HODGSON proposes, with his usual munificence, to present this copy to the Calcutta Asiatic Society, while he destines another complete copy of the printed *Kahgyur* for the Royal Asiatic Society of London.

Of the Sanscrit originals of these precious stores of Bauddha learning, Mr. HODGSON is endeavouring to obtain copies from *Digarchi* and *Lhassa*; they are not to be had at *Kathmandu*. Our countrymen may feel happy that good chance has placed a man of Mr. HODGSON's zeal in the residency of Nipal, in lieu of one of the *new school*. But for him the 300 volumes of Indian literature, preserved beyond the snows in a foreign dress, might still have been unknown, or, if known, despised and unrecovered.

5.—*Botany of the Nilgiris and Southern India.*

A splendid Botanical Book, with coloured copper-plates, including microscopic dissections of new plants, discovered by the Rev. B. SCHMID in the Nilgherries, (Nílgiris), and sent home to Germany, has been commenced to be published by a talented Professor of Botany in the University of Jena. The work will be worthy of the Science. The 1st No. is expected to reach India within a few weeks, and every quarter of the year, one decade will appear. The sale of the work, if promoted by the friends of the science in India, will greatly aid Mr. SCHMID in his zealous Botanical researches, and doubtless lead to fresh discoveries.

6.—*Force of the Unicorn Fish.*

"The ship Royal Saxon, of about 500 tons, is now in dock, undergoing the necessary refit after the *dreadful hurricane* she experienced in the Bay (of Bengal). So furious was the tempest, that when it *somewhat* cleared up, in addition to loss of main and mizen masts, the bowsprit was found broken off just outside the head of the stem, *which was unknown to any body aboard, until so discovered.* The diameter is 23 inches! On looking at the bottom, the snout or horn of an Unicorn Fish was pointed out by one of the native work-people, projecting beyond the surface of the plank about six inches; since which, a piece of the plank, with *the horn*, has been cut out, which shews the fish struck the bottom in a diagonal direction, pierced the *copper*, *felt*, and bottom plank of 3¾ in. thick, as well as the timber, one inch. The commander has *this curiosity* now on board.

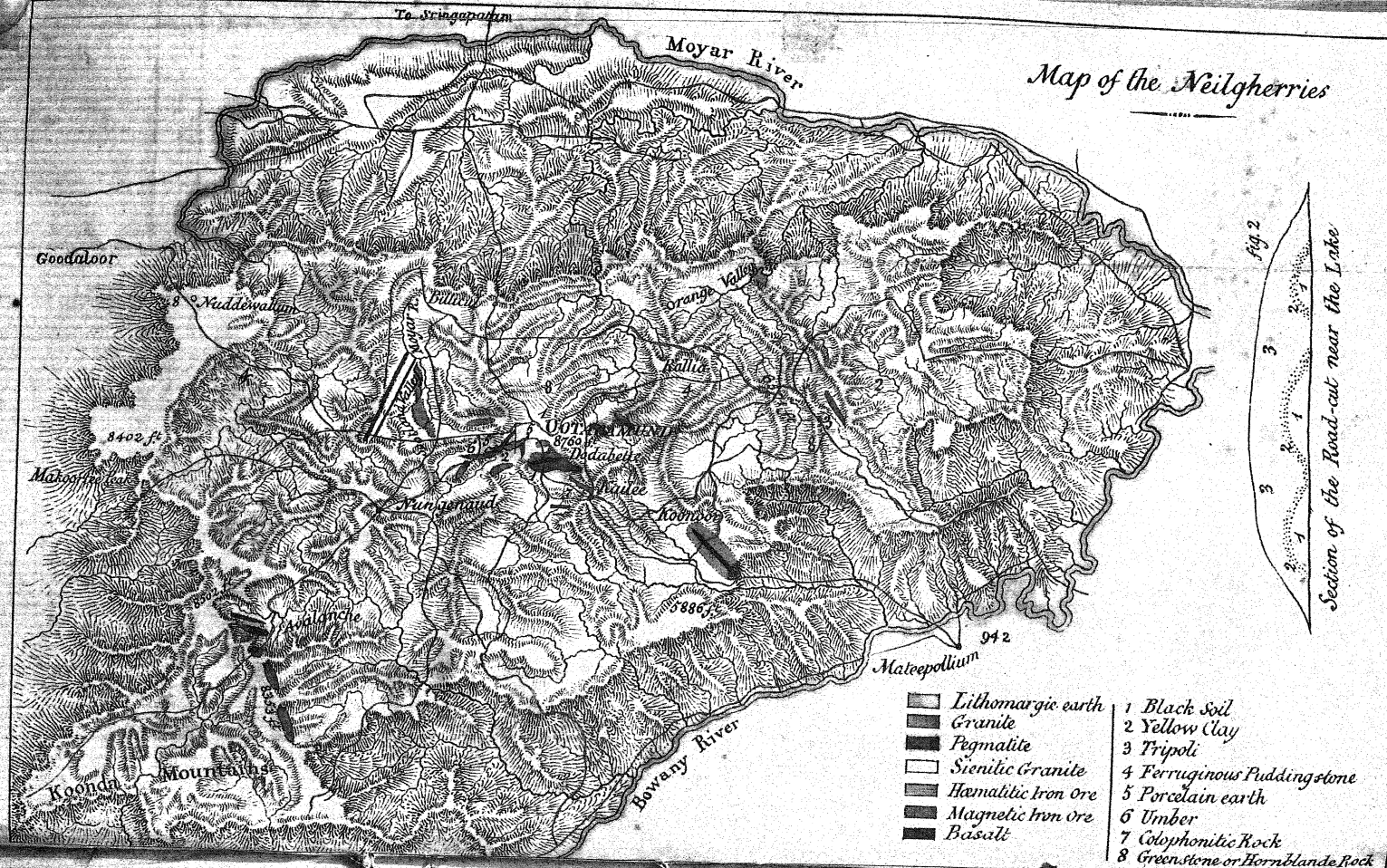
I think a notice of this may prove interesting to some of the readers of *your* Journal.—J. M. S.

[A similar fact was noticed, and the perforated piece of wood presented to the Society, and noticed in the Proceedings of the 26th December, 1833.—ED.]

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of July, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer at 32°.	Wet Barometer, do.	Ags. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Ags. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.
1				84,4	3,1	2,3	92,				87,6	6,5	6,8	91	74,3	103,0		S.	sw.	se.	clear.	fine	cumuli.
2	29,500	28,358	1,142	84,4	3,1	2,3	92,	,438	,120	1,318	87,6	6,5	6,8	91	75,5	104,5	0,70	sw.	sw.	sw.	cum. str.	do	fine.
3	,474	,256	1,218	86,4	4,1	3,6	91,	,416	,270	1,140	86,4	4,3	4,5	92	77,2	95,7		w.	sw.	nw.	cum. cir.	cloudy.	hard rain.
4	,536	,358	1,178	84,3	3,6	3,2	92,	,442	,180	1,262	86,3	5,2	5,2	92	75,	82,1	1,30	s.	nw.	sw.	overcast.	do	cloudy.
5	,551			82,4	5,9			,444			85,0	9,6			76,	95,3	4,00	s.	sw.	s.	fair.	clear.	fair.
6	,513			83,7	5,9			,436			85,4	4,6			78,2	98,8		s.	sw.	S.	overcast.	overcast.	gathering.
7	,494	,230	1,264	86,3	3,4	3,1	92,	,390	,098	1,292	87,3	5,2	5,0	92	78,	103,7	0,10	s.	se.	se.	cum. nimb.	cloudy.	fine.
8	,492	,198	1,294	87,1	3,9	4,0	92,	,388	,110	1,278	87,0	4,0	4,0	92	78,5	100,		s.	se.	se.	cum. fine.	do	cumuli.
9	,492	,204	1,288	87,0	4,4	4,0	92,	,328	,060	1,260	88,0	5,2	4,8	92	78,5	99,	0,15	o.	se.	se.	cum. nimb.	do	cir. str.
10	,415	,190	1,225	86,8	4,1	4,3	92,	,342	,997	1,345	88,7	6,1	5,4	91	77,7	100,	0,75	o.	ne.	ne.	overcast.	drizzle.	gathering.
11	,354	,158	1,196	86,3	3,5	3,3	92,	,270	,108	1,162	86,1	2,2	2,4	92	78,2	101,	0,60	n.	ne.	se.	hard rn.	cloudy.	rain.
12	,516			82,2	5,7			,461			83,2	5,4			75,9	87,8	0,70	se.	S.	S.	var. clds.	showery.	nimbi.
13	,482	,366	1,116	84,6	3,6	3,6	91,	,427	,200	1,227	85,5	4,2	4,8	91	76,2	87,2	0,15	o.	se.	S.	overcast.	sett. rain.	cloudy.
14	,410	,332	1,078	83,1	3,0	3,4	92,	,324	,206	1,118	84,1	4,8	4,0	92	76,2	84,8	0,45	s.	sw.	sw.	sett. rain.	cloudy.	cir. strats.
15	,426	,304	1,122	83,9	4,4	3,8	92,	,319	,140	1,179	85,8	5,0	4,2	92	76,2	93,	0,25	sw.	sw.	sw.	overcast.	do	do
16	,419	,247	1,172	84,8	4,3	3,9	92,	,376	,120	1,256	86,2	3,7	3,4	91	76,4	100,6		sw.	sw.	se.	do	cum. str.	thrg. stm.
17	,452	,296	1,156	84,7	5,1	4,6	92,	,384	,170	1,214	86,6	6,7	6,0	91	75,6	91,5	0,30	S.	sw.	se.	cumuli.	fine.	do
18	,519	,384	1,135	84,6	4,5	3,7	91,	,462	,292	1,170	85,5	4,8	4,1	92	76,4	100,		e.	sw.	S.	gathering.	do	fine.
19	,549			83,0	8,4			,475			85,0	6,3			76,2	10,5	0,15	S.	S.	nw.	dull.	do	shower.
20	,429	,298	1,131	84,7	3,7	2,9	91,	,392	,258	1,134	84,9	3,2	2,7	92	76,	89,6	0,25	W.	nw.	sw.	rain.	showery.	sett. rain.
21	,466	,346	1,120	84,1	4,1	3,2	92,	,397	,376	1,017	83,7	4,2	2,4	92	76,8	90,	0,85	W.	sw.	sw.	cum. cir.	misty.	do
22	,442	,370	1,072	82,9	3,4	2,7	92,	,360	,342	1,018	82,7	3,6	2,4	91	75,4	88,2	1,50	sw.	se.	sw.	do	do	do
23	,479	,490	0,989	81,1	2,6	1,9	92,	,419	,288	1,131	83,9	4,5	3,7	92	75,2	89,2	1,40	sw.	sw.	sw.	sett. rain.	sett. rain.	showery.
24	,496	,384	1,112	83,2	3,2	3,0	92,	,406	,190	1,216	86,0	5,4	4,7	91	74,2	95,	1,15	sw.	sw.	sw.	haze.	fine.	gathering.
25	,485	,346	1,139	84,1	3,7	3,6	91,	,414	,248	1,166	85,4	5,7	4,6	91	76,7	89,5	0,05	sw.	s.	sw.	do	do	showery.
26	,554			81,4	5,3			,509			80,7	3,1			74,6	82,5	0,40	S.	S.	sw.	cir. cum.	cloudy.	do
27	,546	,498	1,048	82,2	3,6	2,7	91,	,421	,276	1,145	84,6	5,1	4,7	91	73,8	94,4	0,50	sw.	sw.	sw.	showery.	do	fine.
28	,506	,472	1,034	82,1	2,5	2,4	91,	,390	,260	1,130	83,9	3,8	3,5	91	75,3	92,	0,75	W.	S.	sw.	cum. str.	do	do
29	,476	,372	1,104	83,3	2,2	2,1	92,	,393	,246	1,147	84,5	3,3	3,2	91	76,	87,5	0,60	s.	sw.	S.	rain.	do	gathering.
30	,512	,430	1,082	83,1	1,6	2,6	91,	,448	,321	1,127	83,9	2,8	2,9	92	76,	93,6		o.	se.	se.	overcast.	gathering	drizzle.
31	,616	,488		82,8	2,7	2,7	92,	,492	,298	1,194	85,6	4,7	4,1	91	74,2	92,6	0,70	o.	sw.	se.	fair.	fair.	gathering.
Mean	29,487	28,335	1,142	82,7	4,0	3,2	92,	,405	,207	1,186	85,3	4,8	4,1	92	76,1	94,1	17,75	SSW.			more rain than usual.		

The index of the hair hygrometer was found to have accidentally become attached between 91° and 92°; when shaken and verified in a moistened chamber, it recovered its proper standing: 8 degrees must be added to the indications of the last month. The rain guage is read off always in the morning, and the amount entered as of the preceding day.


Map of the Neilgherries
To Seringapatam
Moyar River
Goodaloor
Nuddevattum
Makoortee Peak
8402 ft.
Avalanche
Koondahs
Mountains
Bowany River
Matteepollium
942
Kullar
Orange Valley
Kullar
Ootacamund
8768 ft.
Dodabetta
Wadee
Koonoor
Nunjenaud
8886 ft.
Section of the Road-cut near the Lake
fig 2
Lithomargic earth
Granite
Pegmatite
Sienitic Granite
Hæmatitic Iron ore
Magnetic Iron ore
Basalt
1 Black Soil
2 Yellow Clay
3 Tripoli
4 Ferruginous Pudding-stone
5 Porcelain earth
6 Umber
7 Colophonitic Rock
8 Greenstone or Hornblande Rock

JOURNAL

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I.—*Geological Sketch of the Neilgherries, (Nil-giri.) By Dr.* P. M. Benza, *Surgeon to the Honorable the Governor of Madras.*

[Read at the Meeting of the 5th instant.]

The group of hills, called the Neilgherries, may be considered as the southern termination of the Western Ghâts, which at this place end in abrupt, lofty, and almost vertical precipices; the extensive valley of Coimbatúr, dividing them from the Pálghât chain, which, in the same direction as the Ghâts, extends down to Cape Comorin.

The Neilgherries form an elevated plateau, projecting in an easterly direction, from the line of the ghâts, in the form of a triangle, the base of which is the continuation of the ghâts themselves,

They rise abruptly from the table-land of Mysore, in stupendous cliffs, with an elevation of many thousand feet. Two rivers encircle them, as it were, running round their base. The Bhowáni river, rising in the western side of the Kúndas, and among all the hills of that group, runs in an easterly direction along the foot of the side of the Neilgherries, and, just below the apex of the triangle, is joined by the Moyar, which together with the Paykar, having their origin in the Noddimatty range precisely opposite the sources of the Bhowáni, and making a sharp curve after leaving the hills, runs an easterly course, joining the Bhowáni at Dánikncottah, and under that name, after running about 30 miles, they discharge their water into the Cavery.

The Neilgherries*, being the highest hills in the whole of the peninsula, south of the Himálaya, possess a greater degree of geological interest than any other group in this extensive region.

* "The Neilgherry Hills are situated between the parallels of 11° 10′ and 11° 32′ N. latitude, and 76° 59′ and 77° 31′ E. longitude from Greenwich; their greatest extent in an oblique direction, from S. W. to N. S. is from 38 to

Their being almost in the middle of a district, in which one of the most interesting rocks in the Indian formations (the laterite) is found developed in all its characteristic features, adds not a little to their importance in a geological point of view. On account of their superior elevation, they ought to be carefully examined by the geologist, before he extends his researches to the other parts of the chain, of which they form the most elevated point.

It was, undoubtedly, after consideration of this kind, that the late Doctor TURNBULL CHRISTIE, of the Madras Medical Establishment, had begun his geological survey of the peninsula from the Neilgherries, as from a point where the rocks, found at a lower level, are seen in their original state, unmodified, and unaltered by formations and deposits, which events and revolutions, subsequent to the elevation of the whole chain of the western ghâts, must have produced; and had his life been spared, he would, undoubtedly, have given to the public the most accurate and comprehensive account of the geological formations of this interesting part of India, and would have settled many doubtful points in Indian geology, which now keep many of the ablest geologists in a state of uncertainty and suspense.

The few memoirs he published regarding the geology, not only of India, but of those places through which he journeyed, particularly of Sicily, show what was to be expected from a man, who evinced so much information and accuracy of observation on those subjects. Unfortunately for Indian geology, he was cut off at the very beginning of his labours on these very hills, which had in preference attracted his attention and researches.

We are told that the experienced eye of the geologist can easily guess the nature of the rock composing a hill or a system of hills, by the simple inspection of its outlines: thus, spiry peaks show the formation to be primitive; rounded smooth outlines are indicative of calcareous mountains; while the castellated ruin-like appearance of a mountain, is proper to the sandstone formation.

This criterion, however, would lead into error regarding the nature of the rocks forming the Neilgherries. Although their contour is even, smooth, rounded, and, as it were, undulating, the fundamental rocks of which they are composed belong to the primitive class.

Their outline resembles those hills and eminences we meet in districts, resulting from tertiary or alluvial deposits. What the rock

40 miles, and their extreme breadth 15; taking in account the great undulations of the surface, and the breadth above stated being pretty constant throughout, their superficial extent may be fairly estimated at from 6 to 700 square geographical miles.—*Baikie's Observations on the Neilgherries.*

is, which gives those hills the rounded form they exhibit, will be shown hereafter.

With the exception of some vertical cliffs and mural precipices, seen in the boundaries of this elevated plateau, and a few projecting masses of the fundamental rocks on the summits and declivities of these hills, the whole group is uniformly covered by a thick stratum of vegetable earth (No. 1*), which overlying a thicker stratum of red earth, (to be described in the sequel,) supports numerous plants, chiefly grasses, which, growing most luxuriantly in thick contiguous tufts, give the surface a smooth carpet-like appearance. This vegetable earth in general is clayey, and of a grey colour, and very friable. On this soil we occasionally see small rounded pieces of the decomposed subjacent rock, bestrewed particularly on those spots where blocks of the decomposing rock are seen jutting through the soil.

This vegetable soil is replaced in the low valleys and flats at the foot of the hills, by a black soil, such as we frequently see forming the peat-bog in swampy grounds, in which a large quantity of vegetable matter is decomposing (No. 2).

This soil is of a black, or deep brown, colour; of tenacious consistence, when moist; crumbling into powder, and often splitting into prismatic masses, when dry. At first sight, it resembles the black soil of the plains of India. From this last, however, it seems to differ greatly, in containing a large quantity of carbonaceous matter, and much oxide of iron.

To deprive this black soil of the greater portion of its humidity, I exposed it to a heat, sufficient to melt lead, and after having weighed a certain quantity of it, subjected it to an intense heat for an hour; after this, it had lost more than 25 per cent. of the original weight, and had changed into an ochrey red powder (No. 3), without undergoing any vitrification, as is the case with the black soil of the Deccan, (Voysey.) It would therefore appear, that the loss is owing to the oxidification and consequent volatilization of the carbonaceous matter.

This soil, although more frequently found in low situations, is often seen in a thick stratum on the declivities of the hills, such as on the slope of one of the Dodabetta group, facing the cantonment; on that of the Elk Hills, (S.) above South Downs; near the Kaití Pass, and in many other localities, where I have remarked about it, a most luxuriant vegetation of innumerable ferns, of which the roots are seen decaying into a black powder.

In many places below this black soil, and sometimes under the

* The figures refer to specimens deposited in the As. Soc. museum; the letters to the accompanying Map.—Ed.

vegetable earth, we see thick beds of a yellow ochraceous earth abounding with silica (No. 4). Indeed, in some places, as at Kotagherry, it resembles very much the yellow Venetian Tripoli, previous to undergoing preparation for the arts (No. 5). The geological position, however, of the two, differs very much—the Venetian Tripoli, which is brought there from Corfu, and from the neighbouring coasts of Epirus, is found (as I have had opportunities of ascertaining) in the sandstone formation, which alternates with the magnesian limestone*. The kind of Tripoli I met with on the Neilgherries, seems to be the result of the disintegration of a species of iron flint found in primitive formations; some of the specimens I collected, have a great resemblance to the Eisnkeissel of WERNER (No. $5\frac{1}{2}$). Some varieties of the finest white Tripoli arise from the decomposition of silicious rocks, such as calcedony, in Corfu and in upper Italy; but in general, the Neilgherry specimen is not so silicious, and seems to contain a good deal of alumina and iron. It is in this yellow clay that we occasionally see some tubular bodies, formed by concentric layers of the same clay, round the numerous roots of plants that grow on the soil above (No. 6). But what attracted my attention most was, to see (at Kotagherry) those tubular bodies traversing the thick stratum of black earth, which overlies the yellow clay, without having a particle of it in their composition. As if the roots, by a kind of capillary attraction, sucked up through the black soil, without mixing with it, the particles of the yellow clay which, undisturbed by the vicinity of the black soil, arranged themselves concentrically to the root; and the latter decaying has left the cavity of the tube empty†.

* It seems to be an argillaceous iron ore, similar probably to the one at Ashburnham, used for the manufacture of Tripoli, and belonging to the Hastings sands.—See FITTON'S *Geological Sketch of the vicinity of Hastings, page* 50.

† "BROGNIART alludes to something similar to these tubular bodies, enclosing the roots of plants in sandy places, where the iron appears to aggregate the sand round the roots; and he concludes the paragraph by confessing his inability to assign the cause producing it 'et dans ces-çi la cause qui a accumulé l'oxide de fer à l'entour de la racine .... est encore difficile à assigner.—*Tabl. des Terr. qui composent la Surface du Globe, page* 56.'

My friend Mr. Malcolmson, Secretary of the Madras Medical Board, writes to me as follows: On the banks of many of the streams in the Deccan, the black soil is seen penetrated by tubular *incrustations*, resembling *kankar*; they are evidently formed round the roots of plants, the decay of which leaves a cavity which may sometimes be seen to divide and ramify. Some of those in the banks of the Kanar river, Kamptee, near Nagpore, are more than an inch in diameter.—B.

Sergeant DEAN'S Jumna collection exhibits many incrustations of calcareous and ochreous matter of a similar nature.—ED.

Immediately below the vegetable soil, in almost all places, we find a stratum of detritus (in general not above a few inches thick), which is different in different localities, according to the nature of the rock on which it rests. Thus, it is ferruginous on those places where iron ores are found: quartzy and silicious above the thick veins of quartz, which intersect these rocks. But in general it is composed of small fragments, sometimes rounded, and sometimes angular, of the decomposed rock (of which we shall speak hereafter), being identical with that we see on the surface of the soil (No. 7).

The simple inspection of this detritus, overlying, and corresponding in position and nature to the subjacent rock, forces upon us the conclusion, that it does not belong to the alluvium (terrains de transport), but that it has its origin in the disintegration of the rock *in situ*, without any, or any material displacement from the rock which has given rise to it.

Another fact that proves this detritus to arise from the decomposition of the underlying rock, previous to its becoming lithomargic earth, and while in the dry friable state which seems to have preceded it, is, that the porcelain earth, wherever this last earth is found in large beds below the vegetable earth, is never overlaid with detritus; because the rock is all at once converted into porcelain earth, without the intermediate passage into the dry friable rock, from which the detritus arises.

This detritus is seen almost in all localities on these hills; the numerous sections that have been made in their declivities, for the new roads, show it clearly every where. On looking at the banks on the sides of those sections, we observe the detritus adapting itself to all the irregularities and zig-zags of the subjacent rock, or stratum. Fig. 2 of Pl. XXXI. shows this conformity better than any description. It is taken from the bank of the road round the lake near the bund.

That this detritus has not been transported from any distance is further proved, by observing it on the surface of the soil in those places where the protruding rocks are either decomposed or decomposing. We often see the still undecomposed nucleus of the rock protruding through the soil, surrounded and enveloped by the numerous concentric layers of the decomposed rock, the bassets of which we see level with the soil, the upper portion of them having been disintegrated into a detritus, which is scattered on the soil in the vicinity of the blocks. As far as I know, no organic remains have hitherto been found either in this detritus, or in the black soil.

In some places the detritus, for causes difficult to guess, assumes

a degree of hardness, and approaches a conglomerate; the small rounded pieces being agglutinated by a clayey paste, resembling a pudding-stone. This is particularly the case in those localities where it overlies the iron ores, so abundant on these hills. When the subjacent rock is the hematitic iron ore, the conglomerate resembles exactly the pisiform, or oolitic iron ore, and in some places it is hard enough to be used for architectural purposes. The conglomerate in this state of aggregation is similar to some varieties of laterite found in the plains of the Carnatic. But this pisiform iron ore is not to be confounded with another rock, which also resembles laterite, and is met on these hills in enormously thick beds, hereafter to be described.

Below the detritus, in almost all places on the hills, we find a thick stratum of an ochraceous red earth, which occasionally assumes both the appearance and the composition of lithomarge, and for this reason, I shall call it hereafter indiscriminately either lithomargic, or red earth. In some of the lower hills, this stratum is above 40 feet thick, as it is near the bund of the lake. It is this red earth, which, filling up the interstices among the original inequalities of the projecting rocks, has given the hills their rounded appearance, by smoothing all the asperities and irregularities of the original rock; or, to speak more correctly, the projecting points themselves have been smoothed down by their own decomposition into lithomargic earth.

In general, this red earth is of a mottled colour, or streaked with different hues of red, yellow, crimson, white, and grey or brown. It feels unctuous to the touch, and crumbles into dust when pressed between the fingers. It does not form a paste with water, but subsides to the bottom of the vessel. The different colours of this earth are separate and distinct, having a decided line of demarcation, so as to show that they are produced by the decomposition of separate and distinct minerals. We occasionally find in it thick veins of pure white felspar decomposed into porcelain earth, traversing it in all directions; precisely as we observe the same veins of felspar, in an undecomposed state, traversing the hard rock, which forms the hills.

This red lithomargic mould is evidently the result of the decomposition of two of the rocks, which almost exclusively form the Neilgherries; viz. the sienitic granite, and the hornblende rock, or primitive greenstone; of both which we shall speak hereafter.

It seems that before the rock is transformed into red earth, it passes into a dry friable substance, which sometimes has consistence enough to be cut and used for architectural purposes; many of the stones used in the construction of the Kúnúr bridge, are of this nature. The second stage of the decomposition is that, in which it

becomes of a soft consistence and earthy texture: the minerals composing the rock still retaining their relative position as before. Thus we see in the lithomargic earth, what was hornblende, changed into a red ochrey substance; the felspar into a white clay; the numerous garnets into a crimson-coloured clay; the quartz alone remaining unaltered and undisintegrated, which, after all, occurs but in a very scanty proportion in the rock (No. 12).

It is curious to observe, that the substance of the crystalline rock is not protected from decomposition by the thick layers of its own decomposed substance; and notwithstanding its being buried many feet beneath the surface of the soil, under a thick stratum of vegetable earth detritus and lithomargic earth, the decomposition appears to be going on without the concurrence of the atmospheric air.

In many places the entire block has undergone the process of decomposition, and in the sections for the roads, we occasionally see many concentric layers of the decomposed rock, like the coats of an onion when cut transversely. It is not rare to observe, that these coats have, in many localities, a kind of crust (*enduit*) of a black substance, probably oxide of iron (No. 13). The decomposition of the rocks takes place from outside inwardly, and appears to proceed, or to have proceeded gradually. It seems that the felspar and the hornblende are the first to be decomposed, the one (losing the alkaline matter? Sir H. Davy) becomes opaque and whitish; the other, by the hyperoxidation of its iron, is converted into an ochreous clayey substance: the garnets do not resist decomposition long; but the only change that the quartz seems to undergo is in its degree of compactness; becoming friable, and easily reduced into sand by the fingers.

If observations and facts were wanting to prove that this thick mass of lithomargic earth is owing to the decomposed granitic rock of these hills, the following is conclusive. The original undecomposed rock is, as I have said, traversed occasionally by thick veins of quartz. These veins resisting decomposition (which affects the remainder of the ingredients of the rock) are seen *in a continuous course, penetrating from the hard crystalline undecomposed nucleus of the rock into the lithomargic earth, and into the concentric layers of the already decomposed rock.* Therefore, it is impossible to avoid the conclusion, that the red earth and the rock were, at one time, *one mass, traversed by the quartz vein,* which is still seen *continuous* and entire, notwithstanding the transformation of one-half of the rock into red earth.

The appearance I have just described, is seen on the N. bank of the road, which descends from Ootacamund to Kaití valley, after the steepest descent of the Kaití pass is finished; and, I dare say,

may be found in many other places, which I have had no opportunity of visiting.

What I have said of the quartz veins is also applicable to the more numerous felspathic veins, which traverse the rock; with this difference, that they are decomposed, and converted into porcelain earth, while those of quartz are entire and unchanged. But the *continuity* of the vein is evident, although one-half of it has changed nature.

An additional, although negative, proof regarding the transformation of the granitic rock into lithomargic earth, is, that on those hills where no rocks containing hornblende are found, this earth is wanting. This is the case on the summits of Dodabetta, Elk Hill, Kaití pass, &c., in which places the protruding rock being either granite, or pegmatite, it exfoliates in laminæ like granite, instead of decomposing into red lithomargic earth.

It would be worth ascertaining, whether the crimson-coloured dots and streaks in the lithomargic earth be owing to the decomposition of the numerous garnets contained in the original rock. I have had opportunities, more than once, to remark, that in those localities where the sienitic granite abounds with garnets, the lithomargic earth, resulting from its decomposition, has the crimson coloured dots similar to those in the undecomposed rock (No. 14). I have made the same observation in the decomposed gneiss in the Northern Circars, where it abounds with this mineral.

A question naturally presents itself after the above remarks, regarding the decomposition of the granite, and hornblende rock of the Neilgherries. The same identical rocks are found in many parts of the Peninsula, particularly along the chain of the eastern ghâts; and yet their decomposition does not give rise to the same results. As I have visited but very few localities in India where these rocks prevail, I cannot positively say whether or not the result of their decomposition in both localities be the same*. But, this is certain, that the causes, which may have contributed to decomposition in one place, do not exist in the other: of that class are cold, damp, frost, elevation, &c., which are not found in the low lands. Besides, is this decomposition the effect of *existing causes*, or the consequence of *time* and *revolutions* gone by?

Here I must remark, that in some localities, such as near the bund of the lake, on the road below the church, above the bazar, &c. the red earth assumes the composition, texture, and appearance of real lithomarge.

* Doctor Heyne says, "a red soil prevails where sienite forms the apparent ground rock."—*Tracts Historical and Statistical on India, page* 349.

As I have proposed to abstain from speculations, and from far-fetched theories, I shall not enter into any hypothesis respecting the causes of this decomposition. It is enough to have noted a geological fact, which requires but simple inspection to be certain of its existence. I shall therefore proceed to describe some minerals, which are found imbedded in the red earth; some of which might prove very useful and advantageous in the arts. Such is the porcelain earth, found in enormous beds, and of the greatest purity, in this locality.

This mineral is evidently derived (as it is almost in all places where it is found in Europe) from the decomposition of the pegmatite or graphic granite, which is chiefly met with in primitive districts. As this rock does not appear to be common on the Neilgherries, I found it difficult, at first, to account for the origin of the numerous and thick beds of porcelain clay. It was after visiting and examining the summits of some of the highest hills, that I found a variety of pegmatite forming many of the most prominent rocks on them. Such are the summits of Dodabetta, Elk Hill, Kaití pass, some of the peaks of the Kúndas, and probably many other places which I did not visit.

It is undoubtedly to some of the erratic blocks and rolled masses of this rock, or to the decomposition of those beds of pegmatite, into which the true granite of the high hills seems to pass, that the porcelain earth is owing. Of these blocks, still in an undecomposed state, we see many in the valley of Kaití derived, in all probability, from the summit of Dodabetta, or from that of the rock of Kaití, where the pegmatite is seen *in situ*.

By comparing a piece of this porcelain earth, just taken out of the bed, with a piece of the hard pegmatite rock, one cannot but be convinced of their being the same rock; the one in a hard, the others, in a decomposed state. (No. 15.) The pieces of the crystalline smoky quartz (which is the only other mineral entering in the composition of the pegmatite, besides felspar) are still visible in the same situation, as when the rock had not undergone decomposition, having become more brittle, and easy of disintegration.

The porcelain earth is not to be confounded with that which results from the decomposition of the pure felspar veins, so frequently seen in the sienitic granite. By simply looking at both specimens, the difference is discovered (No. 16). The latter has no sandy particles in its composition, such as are found in the other, which by such addition is better adapted for the manufacture of pottery, in which silicious sand is a necessary ingredient.

I speak with some hesitation regarding a mineral I found only in one place on the Neilgherries, and I am doubtful whether it exists in

any quantity in those hills. It is a brown ferruginous clay, very closely resembling amber, particularly that kind which is exported from the Island of Cyprus (No. 17). I found it between two large blocks of decomposing sienitic granite, or rather hornblende rock, with garnets, close to the bund of the lake.

The next rocks to be described are two metallic ores, in all probability, originally imbedded, as veins, in the rock: which last being now decomposed, they are left imbedded in the lithomargic earth: indeed, one of these ores is still seen as a vein, in the undecomposed rock.

The first is the magnetic iron ore, so common in many parts of India, and which, besides the metal, contains variable proportions of quartz (No. 18). The places where I have met with this iron ore are marked in the map: in some of them the ore is imbedded in the lithomargic earth, while in others it is like a vein in the rock. I saw it in this last position in the road descending to Kaití valley, where the metal is very little in quantity, compared with the granular quartz, which in some parts of the vein predominates to the almost entire exclusion of the metal (No. 19).

The two places on the Neilgherries, where I have seen this ore very rich in metal, are, one near the village of Vartsigiri (Vrotagherry), and the other close to, and traversing, the Lake of Ootacamund in two places. The specimen from Vartsigiri (No. 20) is very compact and rich in metal. I took it from a large block, probably the outgoings of a thick bed at the southern extremity of the valley, at the other end of which the village stands.

Generally speaking, the quartz is lamellar, very rarely granular, and it seems to alternate with the metal in parallel laminæ. The appearance, composition, and proportion of the ingredients of this magnetic iron ore are very different in different places; nay, in the same vein. For instance, the vein seen just below the building called Gradation Hall, between the road, and the margin of the lake, in its N. E. extremity, has a compact, metallic structure, highly magnetic, with hardly any quartz (No. 21): a few yards to the south-west, the vein contains a good deal of quartz; the metal is more oxidated, although maintaining still its magnetic powers (No. 22). Following the vein in the same direction, we see it appear in the opposite side of the lake, in the banks of the road, which goes round and close to the lake. There the ore has lost a good deal of its quartz; the iron is more oxidated, and the rock assumes a kind of columnar structure (No. 23). This is the appearance of the vein in the section for the road. But the out-croppings of the vein at the

top of the same hillock are compact, scabrous, and of a slight cellular texture (No. 24). Going on always S. W., we see the same vein continued over the next hill, close to the road going to the Kundas; and so much divested of iron, that it resembles a friable stratified sandstone, the quartz being granular (No. 25).

It is in this kind of magnetic iron ore, particularly in the blocks below Gradation Hall, that I remarked on the quartz laminæ, small brilliant, gold-coloured specks, precisely similar to those seen in the auriferous quartz veins in the rocks of the Malabar coasts, specimens of which have been deposited by my friend Colonel CULLEN in your museum. Does this appearance indicate the existence of particles of gold in this ore? We know that in America, gold is occasionally found in the siderocriste, which is a species of quartz iron ore, like the one just described*.

It is the belief of some people, that owing to the similarity of the rocks, of the detritus, and of the quartz veins, of the Malabar coast, and of these hills, gold may be found in this last, as well as in the former. The specimen of the earth I send is taken (No. 26) from an excavation made, some years ago, by an officer, who had been employed on the Malabar coast, for the purpose of ascertaining the existence of gold in the detritus of that coast. It is said that he found gold in the earth dug up on the side of one of the hills of the Dodabetta group, facing the cantonment†.

Before concluding my observations regarding this magnetic iron ore, I must repeat what I said in the beginning; that it is found in thick beds, evidently imbedded either in the original rock, or, which comes to the same thing, in the lithomargic earth, the result of its decomposition.

Iron ores are so common on these hills, independently of the oxides of that metal contained in the minerals forming the rock, that many springs of water are of the chalybeate class‡.

* The specimen of Colonel CULLEN is marked "auriferous quartz, stratified: Nelli Allum, Malabar." The same gentleman sent to your museum another specimen, which he calls "auriferous micaschist," which contains the same kind of shining, gold-coloured specks.

† The sand which results from the desintegration of this species of iron ore is very nearly similar to what is called titaniferous sand.—Does any menaccanite exist in this sand? The rock in which this ore is contained, appears to be similar to that which is seen in Cornwall, from which the sand containing that new mineral is derived. Professor SEDGWICK informs Mr. DE LA BECHE, that the menaccanite of Cornwall is derived from the *decomposition* of a *hornblende rock*, composed of hornblende and felspar.—*Geological Manual.*

‡ BAIKIE's Observations on the Neilgherries, page 14.

The next species of iron ore on the Neilgherries is the hæmatitic, forming immense beds, and sometimes whole hillocks, among the hornblende rocks, and sienitic granite. In all the places where it is found, large blocks of this ore are seen projecting through the soil, having a scabrous, cellular, and sometimes cavernous appearance at the surface.

As this rock resembles very much the laterite of this part of India, I shall be more particular in describing its geological position and association, in order that it might be seen whether it ought to be classed with the laterite of the low lands, or among the iron ores found in many other parts, associated and in veins, in primitive districts.

Before entering into the description of this rock, I must remark, once for all, that the position and association of the rocks on the Neilgherries is not so easily ascertained, and clearly seen, as in other localities of India, on account of the enormously thick stratum of red earth and vegetable soil, which cover uniformly the whole plateau. So that we are often reduced to the necessity of judging of the nature of the rock composing the hills, by the few projecting masses at the top, or on its declivities.

It is for this reason, that I am unable to say positively whether the rock I am going to describe be overlying, or one of those metalic veins which traverse the original rock; although I have more than one reason to surmise, that the last is the position of this ferruginous ore on the Neilgherries.

All I have been able to ascertain regarding this ore, may be detailed by describing one or two of the localities, where this formation is seen developed in a more marked manner than any where else on the Neilgherries.

The most extensive formation of this hæmalitic iron ore is seen on both sides of what I shall call Scotland Valley*. It is the valley through which the superfluous waters from the lake discharge themselves into the Moyar river. This valley runs nearly E. and W. above two hundred yards below the bund of the lake; close to the left bank of the stream, we see a large block of compact iron ore jutting through the soil (No. 27). Proceeding westward along the right bank of the torrent, for about a quarter of a mile, we come to a place where the stream is joined by another flowing from the S. W. On both sides of this river (until we come to this junction), the projecting rocks,

* Sir Frederick Adam, our present Governor, while on the hills, used to call it by that name, on account of a resemblance he saw in it to some place in Scotland.

which in some places make up knolls and hillocks, are of the usual sienitic granite, with a good deal of hornblende and a few garnets.

On fording the river, at the place of junction, we see on the opposite bank all the projecting rocks to have totally changed their character; they are now cellular, hæmatitic iron ore, rich in metal (No. 28). That rock is seen protruding through the soil of this and of the next hill (W). Some of the enclosures for cattle on the declivities of this hill are constructed with large masses of the cellular iron ore, which however in some of them has a very compact structure (No. 29).

The highest of the two hills appears to be entirely formed of this rock, of which huge masses are seen in the intervening ravine. On the summit of the highest hill, the rock assumes a pudding-stone-like structure, being a hard conglomerate of numerous rounded pieces of ferruginous clay iron ore, strongly agglutinated together by a clayey cement (No. 30). A prodigious number of these rounded pebbles are scattered about, covering nearly the whole of the summit of the hill (No. 31). Many of the hard blocks of this conglomerate resemble very much (if they are not identical with) the laterite of the low lands of India.

Descending from the summit, along the western declivity of the hill (facing Pinnapal Hill), and only a few yards from the top, the rock insensibly changes its appearance and structure. It becomes by degrees more compact, and loses its cellular structure; in short, it assumes the compact appearance of common hæmatitic iron ore (No. 32), very rich in iron; and in this state it continues to the foot of the hill on that side, where some of the projecting masses of this iron ore are flanked by others of sienitic granite, or rather hornblende rock.

These two hills, on the N. E. side, and at their foot, close to the stream, are skirted by immense masses of sienitic granite, through which the waters of the river are heard roaring; except at one place, at the foot of the high hill, where the river is forded to go towards the new road from Nandiwatam to Ootacamund. In that place the iron ore bed crosses the stream; forms numerous projecting masses on the slope of the opposite hill, having a N. E. direction; crosses the road of Nandiwatam, and terminates in the summit of the hillock to the N. E. of the road; beyond the latter place, this rock cannot be traced.

Now this filon of iron ore, after crossing the stream of Scotland Valley, is *evidently* and *clearly* seen *flanked* on *both sides* by sienitic granite, jutting in large blocks through the soil, in the very same way

as the masses of the iron ore shoot up; and therefore, it is fair to conclude, that the last do not overlie the former.

I must here call the attention of the reader to the almost imperceptible transition of the cavernous tubular kind of ferruginous conglomerate, into the uniformly compact hæmatitic iron ore of this hill: an appearance that I had an opportunity of observing also in the Northern Circars at Pandagaram, near Samalkátah, where the compact, slaty hæmatitic iron ore is seen passing into a conglomerate very much like laterite (Nos. 33 and 34).

Another view of the hæmatitic ore is obtained below the bluff rocks of the summit of Dodabetta, beyond the villages of Mantú, close to the road, which descends from the hollow between Kaití rock and Dodabetta. Coming towards Ootacamund, we see huge masses of ore protruding through the soil (No. 35). It is scabrous and cellular, but not perforated by tubular sinuosities like the laterite. It is similar to some of the masses of the same ore on the declivities of the hills of Scotland Valley. This vein has but a few yards' thickness, having a N. and S. direction. On both sides of, and nearly in contact with the blocks of ore are seen masses of sienitic porphyry, or rather hornblende porphyry, containing some garnets (No. 36), which, as we proceed towards the villages of Mantú, lose the garnets, and become hornblende rock (No. 37).

The two hillocks S. E., and close to the lake, and on which Cluny and South Down houses are built, are chiefly composed of the same iron ore. The sections in these declivities, on account of the road which goes round the lake, show the ore decomposed into a red clayey earth, imbedded in the lithomargic earth, resulting, as we have seen, from the decomposition of the original sienitic rock.

The same ore is seen near the summit of Dodabetta, on the hill before descending into the Elephant Valley, and in other localities, which it would be superfluous to describe, after having detailed the principal features of those places where it most abounds. I must, however, here recall to the memory of the reader what I have said, speaking of the detritus below the vegetable earth. It is in the localities, which abound with this iron ore, that the detritus is composed of ferruginous rounded pebbles, occasionally cemented together into a hard conglomerate, like oolitic iron ore, by a clayey paste.

The hæmatitic iron ore seems to contain some felspar, which in this rock is decomposed into a yellowish clay, lining some of the cavities in the rock: but I never found any quartz in it.

Before concluding these details regarding this iron ore, I will point out some particularities, in which (notwithstanding its similarity in

appearance) it seems to differ from the laterite of the other parts of India, that I have had an opportunity of examining. The rock of the Neilgherries is by no means so cavernous, and has not so many tubular sinuosities as the laterite of the Carnatic, Northern Circars, &c.; it seems also to be richer in metal, and, what appears to constitute a marked difference, it is entirely divested of any quartz, or sandy particles, which abound so much in the laterite of other places. Besides, we are told by Doctor HEYNE, that in the laterite of the Red Hills, Nellore, &c. a marl or carbonate of lime is occasionally one of the ingredients; no traces of this carbonate are found in the stone of the Neilgherries*.

That this rock of the Neilgherries is to be classed with hæmatitic iron ore, rather than with the true Indian laterite (an overlying rock), is very probable, considering that rocks similar in appearance to it are found in Europe, while the last is peculiar to India†.

It is said of the Indian laterite, that it is associated occasionally with trap. On the Neilgherries, basaltic dykes are not rare, yet I never saw what VOYSEY remarked in other parts of India, viz. the passage of basalt into wacke, and into iron clay, (by this last name, meaning laterite;) another additional difference between the two rocks.

Hitherto no organic remains have been found in this rock on the Neilgherries, which appears also to have been the case with the laterite of the other parts of the peninsula.

I am not positive regarding the existence of manganese on these hills: my friend Colonel CULLEN says, that it is found mixed in the iron ore near the lake; and I found a straggling piece of this ore in the valley of Kaití (No. 38), which I have not analysed, but which has all the external characters of one.

The lowest visible rock of the Neilgherries is of the primitive unstratified class, including true granite, pegmatite, sienitic granite, and hornblende rock: sienitic gneiss, and hornblende slate are occasionally seen, but they belong more to the outskirts of the hills than to the group itself. Besides these rocks, we find granitelle, and a rock composed of four minerals, felspar, hornblende, garnets, and quartz.

True granite, composed of felspar, quartz and mica, is not of rare occurrence; it frequently occupies the summits of the highest hills: thus it is seen in some of the Kúndá range, and of the Dodabetta group;

* Tracts.

† If my memory serves me right, I think I saw in your museum a specimen marked "black, brown, solid and perforated iron ore, from Poetz in Upper Lusatia," which appears to me similar to the Neilgherries hæmatitic, cavernous iron ore.

‡ No. 38 is decidedly an ore of manganese.—ED.

I never saw it, except in the form of erratic blocks, in the low valleys (No. 39). In those places it has the usual appearance of immense masses split both by vertical and by horizontal fissures, into columnar or prismatic figures; they, however, no where assume the tor-like appearance so common in the granitic hills in other parts of India. The granite occasionally is of a dull, yellowish brown colour, owing to the felspar, which assumes that tint, resembling in that state the *feuille morte* of the French. Doctor HARDY has remarked the same change of colour in the granite of Mewar.

The other species of granite, found always associated with the former, is the pegmatite (No. 40), a rock composed of only two minerals, felspar and quartz. The places where I have found this rock *in situ* are marked in the map: it is a variety of the graphic granite; in aspect very different from the same rock found in other parts of Southern India, in which the quartz is regularly crystallized, and the felspar in long slender crystals, of a pale flesh colour.

In the variety of this rock on the Neilgherries, the felspar is milk-white, lamellar; but not in regular prismatic crystals: the quartz is occasionally of a smoky colour or bluish; and in angular pieces, this colour is sometimes so deep as to appear nearly black. In some of the masses are occasionally seen a few garnets, or a little hornblende; but in general, the rock is exclusively composed of the two minerals, felspar and quartz*.

Of this rock some erratic blocks are seen in the valleys, at the foot of those hills, the summits of which contain it *in situ*: this is the case in the Kaití valley, whither many of these boulders have been probably hurled down either from the summit of Dodabetta, or from the Kaití peak, where pegmatite is found.

It is undoubtedly from the decomposition of these masses, that the porcelain earth described in the beginning of this sketch, arises. By comparing the specimens of the one with those of the other, the identity of the two is established.

The sienitic granite varies in the proportion of its component minerals, and therefore in appearance; sometimes approaching diabase (primitive greenstone), and at others, granite (No. 41½). It almost always contains garnets as one of the minerals composing it; and when this mineral is abundant in the rock, the quartz diminishes in proportion. In the Dodabetta group, I have remarked in some

* This species of granite seems to be very common in many parts of India,—Dr. HARDY appears to describe it in many localities, in his sketch of the Geology of Central India. Many of the blocks jutting up in the plain between Palaveram and Madras, such as that near the Race Course, are all pegmatite.

places the garnets, instead of being either amorphous, or in angular crystallized pieces, assume the granular form, resembling colophonite; in which case, the rock containing it assumes a stratified appearance (No. 41).

The colophonite is composed of granular garnets, greenish hornblende, a little felspar, and less quartz. I have seen in your museum a specimen sent by STRÜVE from Norway, very much like the specimen I now send. The geological position of this rock, which I have found in one or two localities only, is the following. It is to be seen clearly in the ravine just above the high road going to Kúnúr, and close to the public bungalow of Kaití. Two huge masses of a black-looking unstratified rock are seen overlying three strata of a different rock. The upper and unstratified mass is a hornblende porphyry, which passes into sienitic granite. It is very nearly similar to the rock of the same composition I have mentioned as flanking the hæmatitic iron ore, behind Mantu village (No. 42). I have found precisely the same rock overlying the sienitic porphyry of the Garabunda pass, in the Northern Circars. Its hornblende is shining and lamellar, and is the most abundant of the component minerals; the garnets appear to be surrounded by a white powdery opaque felspar, they themselves half decomposed. Below this half-rounded mass is a stratum of a felspar rock, with a very little quartz and hornblende decomposing (No. 43). The thickness of this stratum, which is uniform, does not exceed a few inches; another, but thicker stratum of a granitic rock, lies under, and conformable to the above, being composed of reddish felspar, some garnets, little quartz, and mica; the passage from one rock to the other is sudden, decided, and well marked. Under this, and conformable to it, is a stratum of a rock almost entirely composed of hornblende and granular garnets: this is the lowest of the rocks seen; it becomes harder as it descends, when it assumes the appearance of colophonitic hornblende rock.

This lower rock appears stratified, and besides the seams of stratification, it has some fissures, perpendicular to them; so dividing the stone into prismatic portions. On account of the thick stratum of soil at the foot of the rock, I could not ascertain whether the last-mentioned was the lowermost rock. I must here remark, that the appearance of the two rocks immediately under the hornblende porphyry was that of a decomposing stone, as if from the action of fire.

The rock which prevails in the Kaití range, as well as in other places, is the one which abounds both with hornblende and amorphous garnets. These last sometimes are of a large size, and not

dispersed through the rock, but, as it were, in nests (No. 44). This rock is very like the specimen in your museum from Norway, marked "large garnets in hornblende." Indeed, I think that there is great analogy between the *sienite zirconienne* of Norway and this rock of the Neilgherries (No. 45). I remarked in one place of the Dodabetta group some veins containing quartz and garnets; the last in the granular or resinitic form (No. 46).

Before dismissing the subject of the hornblende rock, I must remark, that although this primitive greenstone is occasionally seen on the summit of some hills, in general it occupies the declivities or the lowest parts of them; and it often assumes a brilliant, laminar crystallization, being then exclusively formed of hornblende (No. 47).

I have seen it passing into hornblende slate at the foot of the Neilgherries, at the bottom of the Kúnúr pass. Here its strata dip to the east, and I am informed, that the same stratified rock is found at the foot of the same group of hills, to the west, the strata in that place dipping west. It is in those places that this rock occasionally passes into sienitic gneiss.

These are all the rocks I have met on the Neilgherries, of which their extensive plateau is formed, and the relative position of which can often only be surmised, on account of the thick covering of soil, and of red earth, which conceals the rock generally.

I must in the last place notice the numerous basaltic dykes which burst up through all these rocks indiscriminately, without however overlying them, except in one situation; and even there the basalt only forms a small ridge, flanked by the fundamental rock.

I shall describe briefly those places where I have had opportunity of examining this rock; and first, that in the Kúnúr pass. Not more than a mile from the bridge down the pass, and just below the village of Kúnúr, in the road, many of the blocks which have been blasted, are traversed by a dyke of basalt. In the little ravine close to the road, the dyke is seen *in situ* through the masses of granite in the jungle. This dyke divides in two or three branches, inclosing betwixt them the granite; then it is seen continuing in a north direction, till close to the huts of the village. The projecting masses through the soil indicate the direction of the thick dyke, which in a place near the road is divided in well marked prisms above the granite (No. 48).

This basalt is very compact; has a dull, even fracture; but in one portion of the dyke, I had the opportunity of observing, that the part which was in contact with the granite had the appearance of a crystalline hornblende, which passed into compact hard basalt towards the centre of the dyke. I also remarked, that where the dyke

was in contact with the granite, the basalt was projecting in a small ridge, which was divided into small prisms, as if the consequence of sudden refrigeration, and subsequent contraction (No. 49). The masses under the village, exfoliate into concentric laminæ, in which are some needle-shaped shining crystals, probably of augite (No. 50).

Another enormous dyke of this rock is seen in the chain of hills which connects Dodabetta with Kaití pass. The summit of the hill, which is between those two mountains, is formed of basalt in huge masses, some of which affect the prismatic figure. In general the large blocks are not so compact as the thin ramifications of the dyke traversing the rock, but the hornblende in the former is nearly granular and shining, somewhat approaching primary greenstone.

On the eastern and western *slopes* of this little ridge, the rock, of which the hill seems formed, is seen in huge projecting masses, so that the basalt does not appear to overlie the rock, but to have burst through it, vertically, in the centre of the ridge.

Going along the ridge from N. to S. after passing a little hollow, we ascend the hill, the summit of which is basaltic. The first intimation we have of the existence of this rock, is seeing many of the blocks of pegmatite traversed in all directions by a reticulated infiltration of basaltic matter (No. 51). On looking at the surface of the blocks level with the soil, we see it divided in irregular portions by the ramifications of the dyke.

Examining some of these masses, we see evidently that, in many of them, the thickness of the dyke diminishes as it proceeds upwardly, and therefore showing the injection of the basalt to have taken place from below. The following appearance exhibited by one of the blocks, shows clearly this direction of the basalt. It is a large mass of pegmatite exfoliating in thick laminæ. Portions of one of these had been removed, either by disintegration or otherwise; the remainder (perhaps a foot thick,) was still overlying the nucleus of the rock, which was nearly level with the soil. A basaltic dyke, an inch thick, was observed in the nucleus of the rock, which had been denuded of a portion of the laminæ; but this dyke did not penetrate into the upper remaining portion of the laminæ, which was incumbent on it. This dyke continued evidently under the remaining portion of this laminæ in the nucleus of the rock.

Going from Ootacamund towards Nundiwatum, along the new road, after about three miles, we meet with two basaltic dykes close to the road.

The first is seen near a small stream, like a ledge projecting at an

angle with the horizon, and the basset of which is hardly a foot above the soil. Its dip is west; its direction nearly N. and S.; and it is seen continued along the declivity of the hill for some hundred yards. It is traversed by fissures in different directions, giving the pieces a prismatic appearance. Proceeding N. we see in the next hill another and thicker dyke, with precisely the same direction as the former.

The basalt in this place traverses sienitic granite, and it is seen clearly on the side of the road. The pieces of all shapes, as prisms, cubes, rhombs, are strewed below the newly cut road. Above the road, the projecting masses of sienitic granite are traversed by innumerable ramifications of the dyke, enclosing between them pieces and masses of the fundamental rock (No. 52).

The same observation made when speaking of the Kaití dyke, is also applicable to this: the small basaltic veins have a compact, and dull texture, while the body of the dyke itself has a granular-like structure, and somewhat shining (No. 53).

In some of the Kúnda mountains, as that of the Avaláche, I also noticed some of these basaltic dykes; and judging from the numerous rounded blocks and pieces of basalt seen in the bed, and in the banks of the river, which descends from the hills N. of the Avaláche, basalt must be very common in that group.

Basaltic dykes are not rare in those places, which I have had an opportunity of visiting in the plains of India. I have seen them through granite and gneiss in Mysore; through porphyry, near the erratic hill of Adamanacotta; through hornblende slate, near Mottipollium; through porphyry, near Garabunda (Northern Circars), and in many other places. Are these dykes the fissures through which the enormous mass of trap, overlying most of the rocks of the peninsula, burst up? and which, subsequent events and revolutions having removed, the vents only through which it was forced up remain to be seen?

It is a well-ascertained fact that the structure, if not the nature, of rocks in contact with the basaltic dykes, is often greatly changed or modified. I saw nothing of this alteration in the rocks close to the dykes I have been describing. The specimen I send, shews no other change, except a slight diminution of cohesion among the composing minerals, and that not in a very marked manner, nor in every locality.

The above described are the rocks I had an opportunity of examining on the Neilgherries, having met none of the secondary, and much less of the tertiary class. It would appear from this, that the elevation of this plateau, and probably of the whole chain of the western

ghats of which the Neilgherries are the southern termination, happened at a period long anterior to the existence of life on our planet.

It is for this reason that I think HUMBOLDT's opinion not supported by facts, when he says, " the chain of the Ural, the Baloor tâg, the ghats of the Malabar Coast, and the Vringckan are probably more modern than the " Chains of the Himalaya, and the Teenckan*. We know, that in the Himalaya, at several thousand feet elevation, and on the declivities of the highest ridges themselves, organic remains have been found in limestone, which seems of the age of the carboniferous group.

The nummulitic limestone of Chira Punjí, and the conglomerate rock, which forms the Deria Dún at the foot of the Himálaya, appear to assimilate those mountains to the Alps†. Therefore the Himalaya must have been heaved up at a period posterior to that when the Western ghats were elevated: these last containing not a trace of organic remains in the rocks which form them, while the former abound in them.

ELIE DE BEAUMONT admits the greater antiquity of the Malabar ghats over the Himalaya chain; but he conjectures, by the direction of the ghats being parallel to the Pyrenese-Appenin system, that they may probably belong to his sixth revolution of the surface of the globe. The passage, in which he expresses this perplexity, is worth transcribing, to show of what importance it is to establish the association, and the geological position of the laterite.

" Vouloir suivre ce système jusque dans l' Inde paraitrait peut-être abuser de la faculté des rapprochemens: cependant je crois devoir faire remarquer que la chaine des gâtes sur la côte du Malabar semble se cohordonner à la direction, dont je m' occupe. La grande faille, à laquelle parait dû l'escarpement occidental des gâtes, en élevant le plateau du pays des Maharattes, du Deccan, du Carnatic a élevé du même tems, le grand depôt argille-ferrugineux de laterite, qui forme les points plus élévés de ce plateau, ainsi que le montre la coupe des gâtes donnée par M. CHRISTIE. Il est à regretter que ce depôt de laterite, qui couvre dans l' Inde de si vastes étendues, n'aie, jusqu'a present, offert aucun fossile, et ne puisse être rapporté avec certitude à aucun étage geologique déterminé: mais on peut toujours remarquer que

* Edinburgh Philosophical Journal, October to January, 1832, HUMBOLDT on the Mountain Chains—Volcanos of Central Asia.

† A writer in the Bulletin des Sciences Naturelles, concludes that the Dehra Dun is analogous in formation to the Molasse of the Alps; and Doctor FALCONER is of the same opinion.—DE LA BECHE, *Geological Manual.*

tant qu'on n' aura pas indiqué d' autre chaine* qui produisse sur la laterite l'effet mentionné cidessus, tout conduit à voir dans les gâtes la chaine la plus récente de la presqu'île occidentale de l' Inde, dont elle est en meme tems le trait geometrique le plus prononcé!"

Then he says in a note, that the Himálaya are more recent than the ghats, and the Andes more recent than the Allaghanys of America.

We see, by what BEAUMONT says, that he suspects the laterite to be the equivalent of those rocks deposited during the period that intervened between the deposition of the chalk, and the tertiary beds. But fossil remains being the only sure guide in determining the ages of these formations, and none hitherto having been found in the laterite, the question must still remain *sub judice*. Besides, we must remark here *en passant*, that the rocks of that epoch in Europe are all stratified, which is not the case with the laterite.

Before concluding this sketch of the geology of the Neilgherries, we must not pass unnoticed the fact of the absence of all sorts of calcareous formation. Even the widely spread kankar is not met with on the Neilgherries, although we find this travertinic deposit at the very foot of those hills, near Mútúpolium (No. 54).

The total absence of stratified rocks, and of calcareous formations, in this group, seems an additional proof of the remote period of its elevation. The only stratified rock, which appears to have been deposited near the place, through which this plateau was heaved up, is the hornblende slate, which is seen both on the east and on the west sides of the hills, being highly inclined, and having an opposite dip: the group serving as the centre of this anticlinal line.

On looking at the map, we see how the numerous valleys and ravines have a different, and often an opposite, direction. Except three or four of them, which diverge in opposite directions from a central point (Dodabetta), the others are so irregular, that it is impossible to refer them to one and the same cause. They certainly do not belong to the class of valleys of denudation, much less to that of corrosion by the streams: the volume of their waters being so very insignificant and divested of pebbly or sandy detritus, which so much hastens the corrosion of the rock, through which the rivers pass. They probably are the original consequence of the elevating force, which either irre-

* "With regard to this part of this passage, to show that there are other chains, having different direction from the Malabar ghats, on the summits of which we see the laterite as an overlying rock, we may quote some of the branches of the Vindiya range, where the laterite overlays either basalt or sandstone; and also many sandstone hills on the Northern Circars: and yet the Vindiya Chain has a different direction from the Malabar ghats.

gularly applied to the different points of the area, or the mass itself, yielding irregularly in the different situations, gave rise to the inequality of the whole surface of these hills.

To conclude, therefore, it seems that the granitic rocks, which occupy the highest hills of this group, forced their way, and were heaved up through the hornblende slate, which was in consequence distorted and lifted up, as it is seen in the outskirts of the plateau, and in some of the low situations among the hills themselves, (the valley S. and close to Kotagherry;) we must also conclude, that the decomposition of the rock forming the red earth, and the detritus, must have happened at a period anterior to the existence of organic bodies; no remains of which have hitherto been found in them.

Specimens from the Northern Circars.

The specimens (from No. II. to No. IX.) are from the hillock near Puddapungalí; a place not far from Yornagorium, and about five miles from, and south of, Rajahmundry.

After traversing the alluvial plains of Ellore, the road passes near a knoll, the rocks of which are very interesting in a geological point of view.

Before reaching the foot of the little knoll in the plain, and in the nullahs, are seen numerous pieces and blocks of a hard whitish limestone, spotted in many places with numerous small black specks. This limestone is compact, the fracture glimmering on account of the many grains of calcspar which enter into its composition.

In the deep nullahs, in the plain, and at the foot of the hillock along the road, we see a conglomerate sandstone, which appears to be the lowest visible rock in this place. Ascending the gentle slope of the knoll, we come upon many masses of wacke, which is decomposing in thick concentric layers. Proceeding a little higher we meet with a thick bed of limestone, similar to the pieces scattered about on the plain.

This limestone abounds with fossil shells, which are clearly and better defined in the upper than in the lower portion of it, where the rock assumes a tufaceous consistence, friable, and almost approaching the appearance of tertiary limestone. The shells are very numerous in this upper stratum; almost the whole rock results from their assemblage; they appear to be chiefly bivalves, with a few univalves. Many of the shells have disappeared, their impressions only remaining; but the oysters which abound in this stratum are in excellent preservation, and easily characterized.

This stratum of limestone, the basset of which is only visible in

the slope of the hillock, has a W. and E. direction. It is overlaid by a thick mass of basalt, which caps the whole hillock. In some places, where this basalt lies immediately over the wacke, this last is converted into jasper. Huge masses of basalt are strewed on the top of the knoll, which forms a kind of table-land extending eastward: some of these blocks in their upper surface assume an amygdaloid structure, the cavities being filled with calcspar.

I could not in that locality see whether the lower compact limestone was or was not stratified. The more superficial and loose blocks, scattered about on the soil, had no appearance of stratification.

Judging from the appearance of the whole of those hillocks which stretch from N. W. to S. E. in the neighbourhood, they seem to have the same geological features as the one just described. Indeed, my friend Colonel CULLEN, with whom I was examining this knoll, told me, that in some of the neighbouring hills, the position of the limestone and of the basalt is seen more clearly, on account of the abruptness of some of their sides, and the deep ravines which intersect them in every direction, so shewing the order of superposition in the four rocks; which is the following: conglomerate red sandstone supporting the wacke, overlaid by limestone, which is covered by basalt*.

The specimens marked X. and XI. are from the diamond mines at Mallavelly, near Ellore; they appear similar to the alluvial detritus in other localities in India, where this gem is found. The kankar accompanies the deposit in the same way as every where else.

No. XX. is the gneiss of which the hillock near the village of Carvera, close to Púndy, is found. In it the Cleavelandite replaces the laminar felspar, and is seen not only disseminated through the substance of the rock, but forming small strata by itself in long acicular crystals†. It is associated, in this rock, with a prodigious number of amorphous garnets, of which some of the strata appear entirely formed.

The porphyry, No. XII., is from the hills which form the northern boundary of the Garabunda pass, going from Kimidy, Garabunda, Cassibogah, to Púndy.

The hills to the south, and close to the pass itself, are sienitic granite, (No. XXXIII.;) while those beyond the porphyric hills to the N., towards the high hill of Mehendry, seem to be formed of that

* The trap near Sagur, described by Captain FRANKLIN, appears to have the same association of rocks as the one of which I send specimens.—*Asiatic Researches, vol.* xviii. *Geology of a portion of Bundelkhand, &c., page* 30.

† Is this the Pindyray of the Telingas, mentioned by Doctor HEYNE in his Tracts, page 283?

variety of gneiss abounding with albite, the continuation of which is seen N. and near Pundy.

These porphyric hills, therefore, may be considered as the out-goings of an enormous dyke of porphyry, which burst through the hills, having the same direction with them, that is N. E. to S. W.; their appearance is that of huge masses of a black looking unstratified rock; in many places completely divested of any sort of vegetation, particularly in those hillocks, which like the one called Chittakúnda, rise in abrupt, vertical cliffs, which seen within a moderate distance might be taken for basaltic rock.

The porphyry exfoliates in thick concentric laminæ, the more depending portions of which falling off, leave the upper in immense tabular masses, or cubic blocks, perched on the upper part, and sometimes on the declivity of the hill: this porphyry has a good deal of hornblende in its composition, sometimes so much, as to become hornblende prophyry.

In more than one of these masses of porphyry, I remarked thick veins or nests of a granitic rock, or rather gneiss, with pieces of sienitic granite imbedded in it. The crystals of felspar in this porphyry are well defined, many of them two or three inches long, and of a foliated structure. This porphyry seems, as I have said, to extend as far as near the sea-shore at Pundy. Some huge masses of it are seen jutting through the soil about a mile north of the village of Carvera, flanked by the gneiss containing ablite and garnets.

I have put up many specimens of laterite from different localities, by which may be clearly perceived the distinction between the *original* rock and the *conglomerate* bearing the same name; but which evidently arises from the conglutination of the detritus of the former. This appears to be the case with the laterite in some places of the plains of the Carnatic.

The specimens (No. XXIII. to XXVI.) are from the hillocks, on which the fort of Puddayaram (near Samalcottah) is built. The position of the visible rocks in this place is the following: the ferruginous sandstone is the lowermost, and has a great degree of compactness, so as to fit it for architectural purposes, in which it seems to be largely employed. It is evidently stratified, the strata being nearly horizontal; the quartz particles are agglutinated by a ferruginous cement.

The sandstone, nearly in the whole extent of the hillock, supports a lithomarge of a whitish or flesh colour, sometimes having a bluish tint. The stratum of this earth is not very thick, and in many places, it is overlaid by a purple-red, compact, slaty hæmatitic iron ore.

which passes insensibly in the upper part into a cellular rock, full of tubular sinuosities, very much similar to the laterite. In some places this ore lies immediately over the sandstone, without the intermediate lithomarge.

Before I finish speaking of the laterite in these low lands I must mention an interesting fact I observed in the thick beds of laterite, which caps the hill on the foot of which Bimlipatam stands. In this place it overlies the garnetic gneiss so common all over this part of the country; and I was surprised to see a *large piece of the subjacent gneiss imbedded in the thick bed of laterite,* more than a foot above the point of contact of both rocks. This fact seems to countenance the inference of the detrital origin of the laterite of these plains and eminences. I am not aware that any pieces of extraneous rocks have been noticed as imbedded in the original laterite.

II.—*Notes of a Tour through Palestine.*

[We have been favored with the following extract from the private letter of a junior revenue officer in the Madras Civil Service, by the friend to whom it was addressed without any view to publication. This will be the excuse, if any such be required, for the cursive style in which it is written, to ourselves a strong recommendation in its favor.—Ed.]

Egypt is the most delightful country in the world to travel through; the boats (if previously ordered from Cairo) are the most comfortable conveyances imaginable. In all the great towns you get excellent leavened bread, and in every village, delicious milk, butter, eggs, fowls, and vegetables. I never lived so well in my life; and the weather was so cool and bracing, that I had a voracious appetite, and enjoyed all the good things. Barring the voyage up the Red Sea, (which except in the steamer is dreadful,) and the journey across the desert from Cosseir, (which is decidedly disagreeable,) I know no place so well calculated to re-establish the health of an Indian as the voyage down the Nile, between the months of October and April; but perhaps January and December are too cold for enjoyment.

My friend and myself left Cairo in the beginning of April, and travelled by land through El Arish, reaching Jerusalem in 14 days. This desert, though tedious, is not near so much so as that from Cosseir. Part of the way at first lies along the edge of the Delta through the cultivations, with plenty of water, and from El Arish, the road is delightful, through the finest pastoral country imaginable. From that place I have been pleased, more than I can tell you, with every thing I have seen in Syria, and have been agreeably disappointed in almost all my pre-

viously formed anticipations. I had always understood Palestine to be at present exactly the reverse of what it was in the time of the Jews—barren, waste, rocky, inhospitable. Most travellers describe it so; but this proceeds partly from the time of year at which it is visited, and partly from the difficulties of travelling compelling people to follow the same route. Travellers from India are generally too early. The seasons here are similar to those of Europe—the spring beginning in March, previous to which all is cold and uncomfortable. You know what a striking difference there is between the black plains of Nowlgoond, when covered with grain, and when bare, parched, and cracked after the harvest. So here, where the heats of summer are excessive, and burn up every thing, and the cold of winter is very severe, the country both looks and feels wretched previous to the approach of spring. We arrived in the middle of April, when every thing was green and smiling; perhaps a month earlier, certainly a fortnight, would have been better, to enable us to have avoided the present heats, which since the beginning of the month have not been exceeded by any I experienced in India, except perhaps when I was shooting lions at mid-day in Guzerat in the month of May. Then the usual route from Egypt is to land at Jaffa, and come through the rocky mountains of Ramlah, to Jerusalem; and thence, having seen the Dead Sea, to proceed by Nazareth to Burút, and sail thence; most of which is the worst part of Palestine. By coming by land, we saw first the beautiful plains of Philistia; and the greater security afforded by the Egyptian Government enabled us to visit with perfect ease the country beyond Jordan, and indeed to see every thing we could have desired.

To an up-country revenue man, the Holy Land must appear one of the most beautiful and productive countries in the world, presenting every capability for raising an enormous taxation, as compared with its size and extent; and this, as well as the numerous evidences of its former great population, presented every where in ruined towns, deserted cultivation, &c. perfectly explains the important part it played when the seat of the Jewish kingdom. The centre of the province presents a mass of limestone hills, running N. and S., bounded by plains backing to the sea-shore on the one hand, and by the valley of the Jordan on the other. These hills are horizontally stratified, and this natural formation, appearing like a succession of steps from the bases to the tops of the mountains, seems to have suggested to the inhabitants the mode of cultivation they have adopted, by improving and extending these natural terraces, and covering them with corn, but more generally with vineyards, fig-trees, and olive plantations. The

grey, broken stones, used in forming these ledges, contrast strangely with the rich products above them; and when the crops are off the ground, and the trees not in leaf, look exceedingly cold and barren. The hills are the richest portion of the land, and by far the best cultivated. The plains are equally capable; but the people are less independent, less able to protect themselves, and are therefore more indolent, careless, and miserable. These low lands are generally left as pasture: where cultivation is tried, it is of the most slovenly and dirty description; weeds and thistles choke the corn, and the fatness of the land vents itself in the production of the most beautiful and varied wild flowers. I saw many wheat-fields so full of scarlet anemones, wild tulips, poppies, blue corn-flowers, daisies, buttercups, and a hundred others, many of which I had never seen before, that they presented exactly the appearance of the richest Persian carpet, but a thousand times more beautiful. Both plains and hills are most abundantly supplied with water. Copious fountains gush out from every rising ground, with which our industrious Reddy and Lingayet ryots would convert the whole plain into one luxurious garden. No tanks, no wells, no boring machines are required here, but merely common intelligence and industry to guide and distribute the streams which God has so bounteously poured forth. Besides the plains of the coast, consisting of Philistia, that of Jaffa or Sharon, and those of Acre and Tripoli, there are inland, the plains of Esdrarlon and Galilee, between Samaria and Nazareth, and the Bekaa, the ancient Cœlosyria, between Libanus and Anti-Libanus, both of great extent, excellently watered, and of surprising fertility; but now grey with huge crops of enormous thistles, only occupied by tribes of wandering Bedowíns, with their flocks and herds and black tents.

In the land of the Philistines, we visited Gaza, a fine old town, where they point out the grave of Samson; the Muhammedans calling him *Nabbí Abd-ul Azíz*. We were inquiring from a Christian about Samson, of whom he had evidently never heard; demanding whether he was a Frank or what? when a green turbaned Musalman, passing by, gave us the desired information. We made out, to our perfect satisfaction, the place to which he carried the city gates, "on the hill over against Hebron." Thence we went to Ascalon, now completely in ruins, and deserted, but singularly well situated, being contained within a low abrupt range of hills, of about two miles in length, forming an arc round a portion of the sea coast, and terminating in the sea at either end. This ridge was crowned with enormous fortifications, the massive fragments of which, still remaining, attest the former strength of the place. Ashdod is also completely de-

stroyed, and the modern village of *Shadúd* is built under the mountain formed by the remains of the old city. At this place, (having first gone to the site of Ekron, and thus seen four of the five great lordships of the Philistines,) we turned out of the common and regular route, avoiding the barren and inhospitable journey from Ramlah to Jerusalem, and proceeded straight through the hills to Bethlehem, the country like the hills behind Dhárwár. I do not think any traveller ever took this road before; it is more direct, quite practicable, even for camels, which we rode, and is very beautiful. The hills are covered with flowers, with the green cistus and arbutus, the ilex, the little white flower called the Star of Bethlehem, and a great variety of others. Round Bethlehem are numerous fine vineyards, each with its "*tower*" and "*wine press*" in it; the round tower, like a cavalier bastion, being probably to guard the produce, and keep the tools, &c. Hence to Jerusalem is only five miles.

We remained in the Holy City, called here *Ul Kúds ul Sherif*, nearly three weeks. Part of the time we devoted to an excursion to Hebron, the Dead Sea, and Jericho. Hebron is one mass of terraced vineyards: the Muhammedan mosque, once a Christian church, covering the cave of Macpelah, may not be entered by Christian feet; but we went to Mamre, still recognizable in the name used by the Arabs Ramre, and pointed out by Jewish tradition as the spot where their father Abraham pitched his tent. It is not a plain: there are none in the centre of the hills; but four valleys meet here, and there is a fine supply of water, and it appears the Hebrew word rendered "Plain" may also be translated some kind of *trees*. The Dead Sea is the most dismal scene I ever beheld, and looks like a present, existing miracle; so extraordinary and different from every thing else in nature does it appear. There is no sign whatever of volcanic action in the hills around, by which its original formation has been explained. The air is always extremely hot and heavy, and indeed, we felt it most oppressive throughout the valley of the Jordan. At Jerusalem, and at midday, in the open air, going to Hebron, the thermometer was only from 58° to 65°, in the valley it was 96°. I bathed, as all travellers do, in the salt and pungent waters of the Dead Sea, in which it is impossible to sink; but I infinitely more enjoyed a swim of half a mile down Jordan, a small but deep and rapid stream: so much so, that the Israelites could never have crossed it without the miracle that divided its waters. The plain of Jericho is a fertile jungle, full of wild hog. It is watered by a fine stream flowing from the fountain of Elisha, now called *Ein-us-Sultán*, and might easily be rendered what it once was, the most fertile spot in Palestine, where only the balsam and

palm trees grew. *Ein-us-Sultán* is a beautiful spot, abounding with game, and flowing out of the ruins of Jericho, which are here, and not at the village of Rihhah, as generally said. It put me exactly in mind of the Diamond fountain described in the Crusaders, and must indeed have been the identical spot where Saladin and the Knight of the Leopard met; for it is directly in the way from Ascalon and Jerusalem to the wilderness of Engeddi, on the shores of the Dead Sea, whither, if I mistake not, the gallant knight was wending! It may be so with as much probability as the spot pointed out to us by the monks on our way back to Jerusalem, which they asserted to be the identical place where the traveller fell among thieves, and was relieved by the Good Samaritan in the parable—a mishap which actually occurred to your friend Sir FREDERICK HENNIKER, who was severely wounded and robbed here in 1818.

I was quite disgusted with the monkish legends at Jerusalem, assigning a locality to every act, however trivial, that is mentioned in Scripture; and also to many that are not mentioned at all. Here PETER heard the cock crow; here our Saviour fell when bearing the cross; here he rested his hand on the wall, and made a large hole in it; here the holy maid Saint somebody gave him a pocket handkerchief to wipe his brow. Then the whole locale of the Holy Sepulchre, Mount Calvary, &c. crowded within the space of one church, is a manifest and absurd fiction, and completely paralyzes all one's sensibility and enthusiasm. The gross superstition of the Christians here exceeds belief, and is only equalled by the hatred and animosity which the different sects, Greeks, Armenians, Latins, Copts, Maronites, entertain towards each other. This both explains and justifies the contempt with which the Turks treat them, and all other Franks, in consequence. As for the English, they say they have no religion at all, and both Catholics and Musalmans concur in calling them Deists and Atheists. Yet there are some excellent Protestant missionaries in the country, (particularly Mr. NICOLAYSEN at Jerusalem,) whose lives testify to the contrary. The Latin, that is the Roman Catholic, monks, of the Franciscan convent at Jerusalem, were guilty of a most abominable act about two years ago. An English traveller, Mr. BRADFORD, arrived at the convent very sick, and asked for the medicine, and the medical attendant of the convent. They refused, unless he would conform to the Roman Catholic faith: this he declined; but as he got worse, he said he would do any thing, only give him medicine. He died, and was buried in the Catholic burying-ground, with a fine Latin inscription, abounding in false concords, recording his conversion from the Protestant to the Roman creed! We were present at the

festival of the Greek Easter, (the old style,) when the Armenians, Greeks, and Copts perform the miracle of the Holy Fire, the grossest delusion ever practised by the priesthood on a superstitious laity. All Saturday evening and night, the church was full of Greek and Armenian pilgrims, running about the Holy Sepulchre in the most indecent manner, shouting, carrying each other on their shoulders, and every species of sky-larking. Two or three processions and some other mummery occurred at intervals during the night; and on Sunday forenoon, the Greek Patriarch and Armenian Bishop entered the Sepulchre, and very coolly poked a lighted candle through a little hole, declaring it to be the Holy Fire, just sent down from Heaven. All the pilgrims rushed to light their candles at it, the Armenians succeeding in doing so first. The crush was tremendous, and was followed by a melancholy catastrophe; for either the Greeks, jealous at the Armenians' getting away first, or from some other cause not known, a rush took place to the door, which had been locked since the preceding evening, and in the struggle numbers were trodden down and suffocated. We were trying to get out, unconscious of what was going on, and were nearly involved in the press. I cannot express the horror I felt when I found myself hurried *on* to a heap of dead and dying, from which I rushed back into the church. They reported to the Pasha 133 bodies carried out for burial; but there were many more not reported: the number must have exceeded 200. The number of pilgrims was greater this year than had ever been known; the Greek war and the conquest of Syria by the Egyptians having prevented the concourse of devotees for several years. Their number was estimated at 16,000. What made the circumstance more singular was, that on the Friday the Armenian Bishop, through the exertions, and indeed express stipulations of the principal people of the Armenian race, who are rapidly rising in intelligence, had intimated to the pilgrims, that the whole was a trick, and that it was to be discontinued after the present occasion.

There are however many interesting localities about Jerusalem, of which no one can doubt. Mount Sion and Moriah, the Temple Olivet, Valley of Hinnom, Bethany, all of which are very striking, particularly the very road by which our Saviour came triumphantly from Bethany to Jerusalem, where he wept over the city, and which can never be mistaken. I was deeply interested with this. The Mount of Olives is beautiful: you have a grand view of the city and of the Dead Sea from the summit.

We saw the Jewish Passover, and visited many of the principal Jewish families. They are an interesting race; many of them, fine venerable-

looking men. They present the appearance of every nation of Europe. The German Jewish are fair and blue-eyed; the Spaniards, olive and dark; the Moriscoes from Barbary, swarthy and burnt; the Polish different from all. All speak the languages of the countries to which they belong; they have no national feature or appearance like the English Jews. Many of the women were beautiful, and they alone, of all the women I have seen in the East, enjoyed the same consideration with the women of Europe, coming out to receive strangers, and joining in conversation with their husbands.

From Jerusalem, we went to Naploos, the ancient Samaria, through a very mountainous tract, full of terraced vineyards, and stood by the well where our Saviour talked with the woman of Samaria, between Mount Eual and Gerizim; thence through the most lovely green valleys, each one with its little clear rivulet, to Sebaste, the capital of Herod, where John the Baptist was beheaded; and in two days more, across the plain of Esdraelon, watered by the brook Kishon, "that ancient river," where Deborah defeated Sisera, to Nazareth. There is nothing remarkable there, except the associations connected with a place where our Saviour resided for 30 years of his life, and over every part of which he must have trod. It is a pretty town among green hills. Here my companion fell sick, and we found, that though vaccinated, he had got the small-pox, probably from the pilgrims in the Church of the Holy Sepulchre. His attack being slight, I left him in the convent, and proceeded a 12-days' trip into the Haouran with two other travellers, the Honorable Mr. CURZON and Sir GEORGE PALMER. We passed Mount Tabor, Endor, Nain, and crossed the Jordan at Bethsan, from which we had a most beautiful march to Adjelún, and thence to Jorash, through a finely wooded hilly country that put me much in mind of some of the finest country about Kithúr, or a little more to the west of the Belgaum road, where the true forest begins: the trees were fine oaks and ilices, and game abounded. All this is comprehended under the general name of Gilead, more particularly it was the land of Og king of Bashan, still as famous for fine cattle as formerly. The castle of Adjeloon (see JOSHUA'S miracle of the sun and moon standing still), is a grand object on the top of one of the highest hills, towering over all the wooded eminences around. The ruins of Jorash are very extensive and magnificent; a street of ruined Corinthian and Doric columns, nearly two miles long, two theatres, two temples, one with a grand portico in good preservation, and many other large ruins, attest its former magnificence. They were stately fellows, these Roman Governors. Here we found at their different towns of Bethsan (Scythopolis), Gerash, Ammon, Oomkais

(Gadara), all within two or three days' march of each other, forming the district called by the Romans the Decapolis, in each place one or two fine theatres, temples and great ruins, which proved how liberally the Roman Prætors were allowed to disburse the public money without sanction. Between Jorash and Ammon, we crossed the Zirkah, the ancient river Jabbok, entering the country of the Amorites, still hilly but destitute of wood; and then getting into the plain of Haouran, we skirted it to Oomkais, and lake Tiberias. This plain extends as far as the eye can reach, I believe even to Bagdad, and is tenanted by the Bedoweens only, of whom the Annesy tribe are found reaching nearly to the Gulph of Persia. There are a few villages near the Jebel Haouran, to one of which, named Bosra or Bostra, where there are also fine Roman ruins, we wanted to go, but could not, from want of water, and the excessive heat; and I was not sorry, for the plain of Haouran is not inviting. The fine part of Syria ends with the Decapolis. Tiberias is more interesting than beautiful—a fine clear, blue lake, about 16 miles long by eight broad, surrounded by bare rocky mountains, but it is interesting from being the scene of most of our Saviour's early miracles. It is always very hot here, as it is in the valley of the Jordan. The most remarkable feature about it is Mount Hermon, covered with eternal snow, rising over its (the lake's) northern side. It is the most remarkable mountain in Palestine, visible from almost every part, even from near Jaffa. Returning to Nazareth by Cana, I found my fellow-traveller quite recovered; but alarming reports being now prevalent of an insurrection having broken out against the Egyptian government, we deferred our plan of proceeding straight to Damascus, and turning westward to the sea coast we made the best of our way by Mount Carmel, Acre, Tyre, Sidon, to Bieroot. Here ascertaining that the commotion had not yet extended to Damascus, we crossed Lebanon and got there, visiting the Ameer Basheer in our way. The latter part of the road to Damascus was extremely dry and barren, the weather too was extremely hot. We therefore felt the full beauty of the situation of this city, for which it is chiefly remarkable, in the plain of the Haouran, watered by the river Banady, which irrigates innumerable gardens and orchards, and imparts an appearance of the richest verdure and fertility to the whole. The Damascenes have been obliged to relinquish their bigotted hostility towards the Franks since the rule of Muhammad Ali, and Christians may now ride into the gate, wear the white turban, and enjoy all the other privileges of Muhammadan subjects; nay, several of the chief persons showed us the interior of their houses, and one Abdullah Beg, son of Assad Pasha, who has the most magnificent establishment in the

place, even showed us his haram or the female apartments; but we are the first Franks who had been admitted to them. They are truly magnificent; realizing the descriptions of what one reads in the Arabian Nights. Spacious courts, with fountains and reservoirs and orange trees growing in the rooms all around, ornamented with arabesque painting and gilding, windows of painted glass, and luxurious divans. There is not a house that has not a fountain playing the whole day; but to this is attributed the unhealthiness of the city, which is extremely subject to fevers and agues; the density of the gardens, however, not a little contributing. The inhabitants give themselves up to continual enjoyment; they think of nothing but how to get most "*keef*," a word they continually use to express their indolent gratifications under the shade of their fruit trees, by the side of the numerous streams that flow through and round the town. All have a voluptuous and dissipated look, so that a Damascene can be recognized any where. I own I should not like to live there, nor to give myself to such an indolent Epicurean mode of existence, coupled as it is with continual fevers and visceral complaints. The bazars are very fine, and well but not grandly supplied. Ices abound, and iced water is hawked about the streets for even the poorest. We returned by way of Balbeck, the finest remnant of antiquity I have yet seen; add to which, the air is cool and salubrious, and the landscape around remarkably rich and beautiful. Mr. P—— and our other two friends finding it too hot, went straight back to Bieroot, and I alone took a detour by the cedars of Lebanon, crossing the highest summit of the mountain among the snow, to see the small and remarkable clump of trees, the only ones now remaining, and returned by way of Eden and Tripoli, to this place.

I have on the whole been delighted beyond my utmost expectations, and I think have seen every thing in the most satisfactory manner. The climate approaches so nearly to that of Europe, and so many of the natural productions are the same, that a thousand agreeable recollections are brought to the mind of a man who has been long from home, as we Indians have been, which afforded a pleasure I never dreamt of. Such were the feelings with which I first heard the cuckoo—such those with which I first trod on a bed of snow, and saw a flight of noisy jackdaws among the ruins of Jorash. The dog-roses, wild honeysuckles and brambles, the pine tree, and mountain ash, recalled many scenes of younger days in Scotland; while fields of wheat and barley, mixed with jowarree and chenna, the vine, the fig, the olive, the mulberry, gave to the whole a character peculiarly its own. Great quantities of silk are manufactured all along the north

To Srinagapatam

part of the coast, the worms being fed on the large white mulberry, but they use the large wheel in winding it, and the fibre is much coarser and inferior to that of Dhárwár.

The Egyptians came to Syria under the most favorable circumstances. The people received them with open arms, and more than by the exertions of the invading army, promoted their success. The Pasha promised them a three years' exemption from taxes, and held out many other fair prospects. But he forgot to keep his word; nay more, he levied much heavier imposts than the officers of the Sultan had been wont to take: which from his greater military establishments, and the superior energy of his government, he was enabled to enforce. The miri or land tax of the Porte, is $\frac{1}{10}$ of the gross produce. All the land is therefore saleable, and the nobility and great men get a good rent, besides the tax, from their private estates. Very large estates belong to the crown, from the law that makes the Sultan heir to all his great officers, and to all who die without direct heirs; in which case the rent, in addition to the miri, goes to the exchequer. The Government dues are taken in three instalments or kists, and those due before harvest are realized through an intermediate agent, called the Soo-basha, generally one of the great landed proprietors or Turkish gentlemen, who is regularly recognised by the Government as the person through whom such payments are to be made. He then, exactly as happens in India, keeps a running account with the village, contriving that they shall always be considerably his debtors; and in recovering his advances, what with interest (18 per cent. per annum), gratuities, fees, &c. he contrives to make from 30 to 40 per cent. The Egyptian government now says to the rayahs, "we will release you from the Soo-bashas, we will take our 10 per cent. only, in one instalment at harvest, but, you must pay us also an additional sum, equal to the profits formerly made by the Soo-basha. The poor rayahs are forced to agree, and go on borrowing from the Soo-basha as much as ever. They were not ill off under the Porte, and now see their error, and bitterly repent the aid they lent to their more imperious tax-masters. Again, the Pasha has introduced lately his absurd system of monopolies, beginning with the silk, which he takes at a price, a very low one, fixed by himself, selling it again at a very enhanced one. I ascertained the prices of grain in Egypt, where the same system is in force. He takes $\frac{1}{5}$ of the produce of all rice lands in kind, and buys the *whole* remaining $\frac{4}{5}$ crops at 25 piastres the ardib or measure, shuts it up in his shoons or store-houses, and retails it for 75, at which price the very fellah who raised it is obliged to re-purchase it. In Syria this gave rise to increased discontent, and an attempt to enforce a military

conscription fanned these angry feelings into a blaze, and the whole of Palestine has been in open insurrection for the last five weeks. The mountainous country I have described as forming the centre of the province, is particularly favorable to undisciplined resistance; the first detachments sent against them were cut off and dispersed. Reinforcements sent for to the camp at Jaffa were intercepted and destroyed, and Jerusalem itself was surprised. At last about 10 days ago, IBRAHI'M Pasha, the son of MUHAMMAD ALI, and Commander-in-Chief, marched on Jerusalem from Jaffa with 7000 men. He was attacked in a narrow pass, was obliged to make a detour with a small escort to ensure his personal safety, (leaving his army to struggle through, which they did, losing more than half their numbers, and gained Jerusalem, which the peasantry wisely abandoned,) leaving his guns in possession of the rebels. Two of his field officers were so alarmed and astonished at this work, that they deserted their colors and fled by sea. Reinforcements have been demanded from Egypt, and so affairs stand at present, all eagerly desiring the return of the Sultan. Meantime a general fermentation exists throughout the land. A dangerous conspiracy was discovered, and quelled by sanguinary punishments at Aleppo. At Damascus, the conscription was so clumsily and stupidly enforced by troops surrounding certain quarters, taking out all sorts of men, whether of good condition or otherwise, violating the sanctity of harams to get at them, that numbers fled and joined the insurgents, and all the shops in the city were for some time closed. 600 poor wretches are shut up in the castle, whom they dare neither to release nor to embody in the ranks. A general feeling is manifested against the Christians, on account of the privileges to which they have been admitted; and in several instances, the Muhammadans have shown a disposition to rise against them. There are a great number of Greeks, Armenians, &c. in all the large towns, generally people of some wealth. The people of Saphet two days ago arose and massacred the Jews. So that every thing looks like an impending storm, and I should not be surprised if it ended in the Pasha being turned out of Syria.

I have no feeling in favor of the Egyptian government. It is true they affect liberal opinions, protect the Franks, and imitate European improvements; but the sole motive and object of all this is the Pasha's personal ambition, and its only good effects are a good police and a greater general security to person and property from all attacks—but those of the Pasha himself. MUHAMMAD ALI, is certainly a wonderful man; but he is, I am now convinced, perfectly selfish, and is not actuated in any way by a desire to ameliorate his country or people. I

was most unwilling to come to this conclusion, but the evidence is so positive I cannot help it. He has drained the population of Egypt, (which was 2,500,000) by continual conscriptions to keep up his regular army of 90,000 men, exclusive of some 20 or 30,000 for his fleet and arsenals, and of those he has seized to labor in his manufactories. So dreaded has this demand for men become, that the peasants now maim themselves to be exempted from service. In the whole of Upper Egypt, I could not find a single ryot who had not put out an eye, cut off a finger, or broken out a dozen teeth; even children of 10 and 12 years old are maimed. I speak soberly and in strict truth when I say, that during four days' sail down the Nile, I landed frequently, and took long walks, asking *every* individual I met, and I only found one not maimed, and he was born deaf and dumb! The aspect of the country is wretched; the villages are deserted and in ruins, much land lying waste, the people looking squalid, poor and miserable. The severity of the system was attested by the frequent insurrections that took place a few years back, but in the open valley of the Nile these were easily quelled. Meantime the Pasha, instead of husbanding his resources to enable himself, now that he has established his power, to reduce the burthens of his people, squanders away his revenue in absurd schemes. He forces the produce of *articles* with expensive purchased machinery, *which* he *could* buy cheaper from Europe in exchange for the natural products of Egypt. He engages in splendid projects, and seeks applause from the people of England and France. These mad enthusiasts, the Saint Simoniens, told him of the advantage of a rail-road across the Isthmus of Suez, and he is now surveying the ground for that purpose. He is trying to realize the splendid idea of Napoleon, of damming the two branches of the Nile, and irrigating the whole of the Delta; and with an almost childish impatience to complete his work, he drives the population of whole districts to the work, neither paying them nor providing them with food, in consequence of which many perish. Then he has sent 20,000 men to subdue Yemen, and to attack the Aseers, a wild tribe of Bedoweens, who will lead them into the desert, and probably destroy all the expensive materiel with which the Egyptian armies are most liberally furnished. Many of these schemes are worthy in themselves, but they are too great for the resources of the country, and the attempt to force them has given rise to a system of relentless tyranny, and reduced the people to a state of misery exceeding what I have ever seen or heard of elsewhere. The only thing I saw that gave me unmixed pleasure, was the Government school at Cairo, where about 900 boys are educated at the public expense, each boy receiving from 15 to 80 piastres a month, his food

and clothing. But there are not wanting who say, the Pasha only supports it to raise up for himself good officers; however, it is good in itself, and the results must be good, and I give him credit for it. I consider the principal points in his character to be ambition, and the vanity of appearing a great and enlightened prince in the eyes of Europe, and I think these will explain his whole policy. He has had the tact to win our representative, Colonel CAMPBELL, completely to his interests, and the good Colonel is his warmest and most enthusiastic eulogist.

III.—*Characters of three New Species of Indian Fresh-water Bivalves, by* ISAAC LEA; *with Notes by* W. H. BENSON, *Esq.*

While our countrymen in India are hesitating to name or to describe as novelties their acquisitions in Natural History, under the apprehension of re-describing that which may be already known to the scientific world, our brethren of the United States are forestalling us, and are publishing in that distant land the acquisitions of their fellow citizens, made under the unfavorable circumstances which generally attach to cursory and hurried journeys through a country. It becomes us, then, to bestir ourselves, and not thus tamely to allow prizes to be carried off from our very doors, to swell the scientific triumphs of our transatlantic competitors.

The following descriptions of three species of *Unio* are taken from the 4th volume of the Transactions of the American Philosophical Society, in which work characteristic figures are given of each shell. The characters are from the pen of Mr. ISAAC LEA, who has acquired perhaps a greater knowledge of the species of this genus, and has described more new ones than any other individual. Having during several years attended particularly to this department of Natural History, and taken numerous specimens of the shells procurable in the provinces, in which I have resided, I have ventured to add a few illustrative notes. Besides Mr. LEA's three species, and the well known *Unio marginalis* of LAMARCK, I am acquainted with three other perfectly distinct species of *Unio* from the streams of the Bengal and Agra presidencies, which I propose to describe in a separate paper.—W. H. B.

UNIO CÆRULEUS. Plate XIII. fig. 25. of Am. Phil. Trans. IV.

"*Testâ angusto-ellipticâ, transversâ, inæquilaterali, subcylindraceâ; valvulis tenuibus; natibus prominulis, rotundatis et undulatis; dentibus cardinalibus lamelliformibus, et in dextrâ valvula solâ duplicibus; lateralibus rectis; margaritâ cæruleo-albâ et iridescente.*

" Shell narrow-elliptical, transverse, inequilateral, subcylindrical; valves thin; beaks rather elevated, rounded and undulated; cardinal teeth lamelliform and double in the right valve only; lateral teeth straight; nacre bluish white, pearly and iridescent.

Hab. River Hoogly, Hindostan, G. W. BLAKIE.

Diam. ·6, Length ·8, Breadth 1·6 inches.

" Shell narrow-elliptical, transverse, subcylindrical, disposed to be straight on the sides and basal margin; substance of the shell thin; beaks near the anterior margin rounded, somewhat elevated, and corrugated with diverging undulations; ligament rather short and straight; epidermis finely wrinkled and bluish green, particularly on the posterior part; rays very indistinct; posterior slope furnished with small undulations and two irregular rays on each side; cardinal teeth lamelliform and double in the right valve only; lateral teeth straight and lamelliform; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the beaks; cavity of the beaks wide and rounded; nacre bluish white, very pearly and iridescent.

" *Remarks.*—This species was brought from Calcutta by Mr. BLAKIE, to whose kindness I am indebted for it and many other fine shells. As far as I have been able to ascertain, it has not been described. From the roughness of the beaks it might perhaps be thought to be only a variety of *corrugata* (LAM.). On comparing the two species, however, they will be found to be entirely distinct; the *corrugata* being " ovato-rhombeâ," while the *cæruleus* is " angusto-ellipticâ." In some specimens the nacre is slightly rose-coloured along the basal margin."

Note.—This shell is extremely common in tanks in the vicinity of Calcutta, and is met with in profusion in the Ganges, Jumna, and their branches. The epidermis is ordinarily brown, and I have only met with the dark-green variety figured and described by Mr. LEA in jhíls in Bundelkhand. It varies much in diameter, being sometimes extremely ventricose, while another frequent variety is remarkable for the smallness of its diameter. All the varieties may be at once referred to this species, by attending to the generally polygonal outline of the posterior part of the shell, and to the rugæ on the beaks and slopes, which radiating in two different sets, form by this junction on the back of the shell, in fine specimens, a series of acute angles. The shallow variety above-mentioned, which has a paler green epidermis, and which is somewhat alate posteriorly, shews this character, in the greater perfection. The extreme varieties would be regarded as distinct species, if alone presented for examination; but I possess a beautiful series which connects them so gradually as to leave no doubt of their identity as a species. My largest specimen, which is an odd valve, is 1·95 inches in breadth. The nacre is occasionally tinged with salmon colour.—W. H. B.

Symphynota Bilineata. Plate XI. fig. 19, of ditto.

"*Testâ subelliptică, transversâ, inæquilaterali, compressâ; valvulis tenuissimis; posteriori margine dorsali elevatâ connatâque; natibus subprominulis, undulas concentricas et duas lineas elevatas ad marginem posteriorem currentes, habentibus; dentibus cardinalibus laminatis et in valvulâ dextrâ solum duplicibus; lateralibus rectis; margaritâ colore salmonis subtinctâ.*

"Shell subelliptical, transverse, inequilateral, compressed; valves very thin; posterior dorsal margin elevated and connate; beaks very slightly elevated, concentrically undulate and possessing two elevated lines which pass to the posterior margin; cardinal teeth lamelliform and double in the right valve only; lateral teeth straight; nacre slightly salmon coloured.

Hab. River Hoogly, Hindostan, G. W. Blakie.

Diam. ·3, Length ·7, Breadth 1·3 inches.

"Shell subelliptical, transverse, inequilateral, compressed, diaphanous; substance of the shell extremely thin; beaks very slightly elevated, concentrically undulated, possessing two small elevated lines which pass (posterior to the umbonial slope) to the posterior margin; valves elevated into a carina and connate in the posterior dorsal margin: dorsal margin a right line; ligament very small; epidermis shining, greenish yellow, darker on the posterior slope; cardinal teeth lamelliform and double in the *right* valve only; lateral teeth lamelliform, long and straight; posterior and anterior cicatrices both confluent; dorsal cicatrices obsolete; cavity of the beaks shallow, very wide, and exhibiting the undulations of the beaks; nacre very thin and slightly salmon coloured, darker in the cavity of the beaks.

"*Remarks.*—This very small species was brought from Calcutta by Mr. Blakie, with the *U. cæruleus* (Nob.). Both were procured about one hundred miles above that city. It resembles, in its outward characters, the young of *S. cygnea* (*Anod. cygnea*, authors). It is, however, more transverse, and differs altogether in the formation of the hinge, which is furnished with perfect cardinal and lateral teeth. In the peculiar character of the *double tooth* in the *right* valve, it resembles the *S. ochracea**. The *bilineata* is easily distinguished by the two delicate lines which pass from the beaks to the posterior margin."

Note.—This species, which is tolerably abundant in the tank on the skirts of the southern glacis of Fort William, is an *Unio* to all intents and purposes. Mr. Lea's genus *Symphynota* is founded on an adventitious character which is incidental to most of the winged bivalves. It culls from various genera, such as *Unio* and *Anodon*, (already well separated on the best of all distinctive characters for bivalves, the difference of the teeth,) species, which otherwise agree with their respective genera, to unite them in one unnatural group. Mr. Lea's apology for its introduction, viz. the difficulty of defining

* See vol. iii. p. 455.

the boundaries of the genera of the *Naiadæ*, can hardly justify its adoption. The assumption that genera are separated in nature by an hiatus has been ably combated by the zoologists of our present English school. Genera melt into each other, and the circumstance of the flanking individuals of each cohort being in contact does not militate against their grouping round the standards which form their rallying points. Mr. Lea has named this shell from a character which exists only in young specimens, and which is also observable in a distinct and interesting species (*U. Theca*, Mihi), of which I possess an unique example from the river Cane in Bundelkhand. The largest specimen of *Unio bilineatus* in my possession, is in breadth, 2.3 inches. The adult shell has a brown epidermis inclining to fulvous towards the basal margin, and occasionally the anterior side inclines to form a wing as well as the posterior. Mr. Lea gives as a character, cardinal teeth "double in the right valve only;" but in every specimen which I possess, a thin lamina parallel with the principal lobe of the cardinal tooth, is more or less developed in the left valve, and interlocks with those on the right; and it is this double lamina in the left valve which forms one of the most valuable distinctions between the adult *bilineatus* and the occasionally symphynotous young of *Unio marginalis*, which has no trace of a double lamina in the left valves. The concentric undulations, on the beaks, which are also observable in the young of *U. marginalis*, also disappear in the adult *bilineatus*.—W. H. B.

Unio Olivarius. Plate XVI. fig. 38, of ditto.

"*Testâ ovatâ, transversâ inflatâ, pellucidâ; valvulis pertenuibus; natibus prominulis; epidermide pertenui, lævi et olivæ colorem habente; dentibus cardinalibus magnis laminatis erectisque lateralibus laminatis brevibusque; margaritâ pertenui albâque.*

"Shell ovate, transverse, inflated, pellucid; valves very thin; beaks slightly elevated; epidermis olive, very thin and smooth. Cardinal teeth large, erect and lamelliform; lateral teeth short and lamelliform; nacre very thin, white and pearly.

Hab. Burrill river, India, Dr. Burrough.

Diam. ·7, Length ·8, Breadth 1·5 inches.

"Shell ovate, transverse, inequilateral, inflated, pellucid: substance of the shell very thin; beaks slightly elevated, rounded and devoid of undulations: ligament very small: epidermis olive, very thin and smooth: rays obscure, cardinal teeth large, erect and lamelliform; lateral teeth short and lamelliform: anterior cicatrices slightly confluent: posterior cicatrices confluent: dorsal cicatrices not perceptible; cavity of the beaks wide; nacre very thin and bluish white.

"*Remarks.*—This interesting little shell is from the fine collection made by Dr. Burrough, during his travels in India, and I am indebted to his

kindness for the specimen figured. It is a perfectly distinct species, and may easily be recognised by its form, its pellucidness, and its smooth olive-coloured epidermis. It somewhat resembles a young *Anodonta* on the exterior, but the elevated lamelliform teeth easily distinguish it from that genus. Its resemblance to a Spanish olive is very striking."

Note.—This shell, which Lieutenant Hutton, (vol. iii. J. A. S.) refers with doubt to the young of *U. marginalis**, from which it is perfectly distinct, is abundant in the shallow pools left on the sands of the Jumna and Ganges after their periodical rise. I have never met with a larger specimen than that figured by Mr. Lea. The colour of the epidermis varies from a pale clear green to a pale brown.

In concluding these notes on Mr. Lea's interesting descriptions, I may observe, that the Asiatic Society is indebted to him for a series of American fresh-water shells, chiefly *Uniones*, of which a list was published in the J. A. S. vol. i. and for a copy of his Observations on the genus *Unio*, printed in 1829.—W. H. B.

IV.—*Description of the Bearded Vulture of the Himálaya.* By B. H. Hodgson, *Esq. Resident in Nipal.*

Ordo Raptores—Fam. Vulturidæ.

Genus *Gypaëtos.*

Rostrum rectum; basi plumis setaceis antrorsum directis tectum; supra rotundatum; mandibula inferior, basi fasciculo, plumis rigidis elongatisque ornata; cera plumis tecta; tarsi breves, plumosi.

Species—*Barbatus*, Lin.

Synonyma.—*Vultur barbatus, necnon barbarus*, Lin. *Vultur aureus*, Gesner. *Nisser or Golden Eagle*, Bruce. *Bearded Vulture*, Edwards. *Lammer Geyer* of the Swiss, Shaw. *Father Long-beard* of the Arabs of Egypt, Bruce. The Bearded Vulture of the Himálaya, so familiar a tenant of the western portion of these mountains, nor yet unknown to, though much less common in, the eastern or Nipalese division of them, seems to have escaped the research of Hardwicke, and of Gould's contributors. There is no delineation of it in either the Century of the latter, or in the Illustrations of the former gentleman. It has also escaped the active and enlightened inquiries of the Zoological Journal, notwithstanding the startling, and, I fancy, exaggerated, notice of it contained in Heber's popular narrative. On these grounds, I am induced to forward to the Asiatic Society a draw-

* Lieutenant Hutton asks if it can be the young of his *Unio*, No. 18, of which the specimens deposited in the Museum Asiatic Society are *U. marginalis*.—Lamarck.

ing and description of a very fine specimen killed in the Kheri pass, by my brother Lieut. W. HODGSON: those who have better opportunities than I have of describing the bird's average size and internal structure, from comparison of numerous fresh subjects, seeming, year after year, disposed to reject the task.

My specimen is apparently that of a mature bird; but its sex is unknown to me. It measures, from the tip of the bill to the end of the tail, three feet ten inches, and has a breadth between the tips of the wings, not less than seven and half feet. The bill to the gape is 4 inches: the tarsi are $3\frac{3}{4}$ inches: and the central toe and talon $4\frac{5}{8}$ inches. The dimensions are given, at length, at the close of this paper; meanwhile I proceed to notice the characters of the bird, and to depict his general appearance and plumage, premising, that (according to my information) his *manners* are decidedly more vulturine than aquiline. Ordinarily, he is met with in groups, or pairs, or singly, without marked distinction of habits in that respect. But the prospect of an abundant repast is sure to collect numbers of the species, too voraciously intent upon satisfying the cravings of an appetite dependent for its gratification upon contingencies, to admit of their betraying any of that shyness of man which the aquiline race invariably manifest. If the flesh pots be exposed at Simla, or Massuri, or elsewhere in the western hills, it becomes necessary to keep a good watch upon them, lest the Bearded Vulture steal a share of their contents; and the offals and carrion-carcases, freely abandoned to him by our European soldiery, and by the peasantry, he rushes to devour, almost heedless of the neighbourhood of human-kind. Such too in their manners are the Bearded Vultures or Gypaëti of Europe and of Africa, which I apprehend are specifically the same with our Asiatic type, due allowance being made for the occasional exaggeration and inaccuracy of describers, as well as for the remarkable variety of aspect which the species itself is apt to exhibit. Of the *lammer geyer* of the Alps, I have access to no particular description: but the detailed accounts of BRUCE and of EDWARDS, relative to the African bird, cannot be carefully corrected by each other, and then applied to the Himálayan subject, without leaving a full conviction of the identity of the species. For instance, BRUCE's assertion of the partial nudity of the head, must be amended by reference to EDWARD's statement, that it is covered with small, close plumes; or, must be accounted for by BRUCE's own surmise, that the subject of his examination was under moult. Neither of their descriptions require any other allowance, in order to suit our bird; for differences in *colour* are too notoriously caused by sex, age,

health, and season, in most species of the Raptorial order, to warrant any nice distinction on that basis.

Edwards gives seven and half feet for the breadth, and three feet four inches for the length of the African variety of the Gypaëtos; whilst Bruce's measurements carry the size of it up to eight feet four inches of breadth, and four feet seven inches of length. My specimen of the Himálayan variety of this bird is intermediate between those two statements: but I have been assured by my brother and others, that mine is decidedly a small individual; and that, whilst no credit is due to Heber's statement of 20 feet between the wings, there can be little doubt that the Indian Gypaëtos frequently has ten feet expanse of wings, and probably, sometimes, even eleven. The general structure and aspect of the Himálayan variety of this species, by their compound character, made up of Eagle and of Vulture, indicate the excellence of Storr's generic title of Gypaëtos, or Vulture-Eagle. The bill and head have a distinctly vulturine cast; but the wings, tail, and feet are scarcely less decidedly aquiline; and, upon the whole, the general semblance partakes more of the eagle than of the vulture.

The bill's length is to that of the head as 4 to $2\frac{1}{4}$; its form is strictly vulturine, distinguished only by somewhat superior elongation, and by the considerably greater compression of the anterior part, or that beyond the cere; where the ridge is almost sharpened, and the sides (as nearly as may be) devoid of convexity. The cere is wanting, and is replaced by a large mass of bristles, originating with the lores and forehead, which bristles, being directed forwards, and closely applied to the bill, entirely conceal the cerous portion of it, as well as the apertures of the nares. The form and position of the nares agree very well with those of *Vultur Pondicerianus*: that is, they are opened *considerably*, and occupy a place much nearer the tip than the gape of the bill: but they are less vertically cleft than in *Pondicerianus*, and have a more anteal aspect. They are long ovate, obliquely transverse, opened forwards, and entirely hid by the bristly incumbent cere coverts.

Another and similar mass of setaceous hair, to that just spoken of, protects the base of the *lower* mandible of the bill, being implanted on its sides; and a third tuft originates on its inferior surface, where the horn ceases, in order to afford extensibility to the gullet.

The last or gular tuft, like the ceral, is directed forwards, extending to the tip of the mandible, and there ending in a fork. This last patch of bristles, (which gives its trivial name to the species,) is freer, or less applied to the bill, than the others are. Hairs, scarcely

less setaceous than those laid over the bill, are likewise directed *backwards* over the head, shading the brows in two narrow lines, which terminate near the occiput, and have a common origin with the cere-coverts. The head, lores, and throat are perfectly clad in short, soft, composed, narrow, and pointed plumes. These small feathers give place suddenly, at the hind part of the head, to others of the same lanceolate form, but of ample size and free set, which adorn the whole neck, above and below, and have considerable affinity to the vulturine ruff. The head is broad and flat crowned, but not so flat or so broad as in the vultures: the eye, like their's, mean and small. The wings are of vast amplitude, reaching to within five inches of the tip of a tail that is no less than 22 inches long. They are high-shouldered, but less strikingly so than in the vultures. The prime quills exceed the tertiaries by 6 inches: first remex $3\frac{1}{2}$ inches less; the 2nd, which is very little if at all inferior in length to the 3rd, and 4th, the longest of all. The outer vane of all these quills is not emarginated; but the inner is strongly so, remotely from their tips. Though there be no appearance of moult in my specimen, I suspect that the relation of the 2nd, 3rd, and 4th remiges, as above stated, can hardly be the permanent and characteristic one; which probably gives 4th quill longest. The tail is longer than in any aquiline or vulturine bird I know, and is much and regularly gradated on the sides, the extreme lateral feathers being six inches shorter than the central ones; I should call the tail, therefore, wedged.

The legs are very short, and less muscular than in the genus Vultur; tarsi low and completely plumed, as in the Golden Eagle: thigh coverts long, reaching, (if directed towards them,) to the bases of the toes. The toes and talons are of the aquiline type: the former of medial unequal length and thickness, and reticulated, with the outer toes connected to the centrals by a large basal membrane: the latter, or talons, larger, acuter, and more falcate, than in the vulture, and as much so as in most of the Falconidæ: the outer fore and hind talon largest and equal; the central, less considerably; and the inner, as much smaller again. The general colour of our specimen is dark brown above, and rusty below; but the whole upper part of the back, and the top of the ruff on its dorsal aspect, are nearly unmixed pale orange: the shafts of the wing and tail feathers are mostly white; and their vanes, as well as those of the wing-coverts, are irregularly varied (for the most part, internally) with yellowish marginal or central streaks. The entire ruff, except where it fringes the occiput, is saturate, unmixed, brown; and the throat is essentially the same, but paler, and touched, here and there, with yellow. The

head and cheeks are whitish for the most part: the ceral and gular bristles, and those over the brows, pure black, as also a moustache or stripe backwards from the gape: bill and talons seemingly horn-yellow; and toes leaden-blue.

Dimensions.

	feet.	*inch.*
Tip of bill to tip of tail, ...	3	10
Bill, length of, ...	0	4
Ditto basal height, ...	0	1¼
Ditto basal breadth, ...	0	2½
Expanse of wings, ...	7	6
Tarsus, ...	0	3¾
Central toe, ...	0	3½
Ditto talon, ...	0	1⅜

Sex unknown.

P. S. Since writing the above description, it has been suggested to me by Dr. Campbell, that I have overlooked an account of the Himálayan Vulture-Eagle, by Lieut. Hutton, in the 34th No. of the Journal. Adverting to that account, I find no reason to alter my own, or to retract the opinion therein stated, that the Indian Gypaëtos is merely a variety of the single known species, which is common to Europe, Africa, and Asia. Lieut. Hutton gives his bird the same length as mine nearly, or 3 feet 11 inches; but he makes the expanse of its wings 9 feet 6 inches. Is there not here some undue allowance for shrinking in his 'old and mutilated' specimen? The wings of his bird agree very closely with mine in respect to the relative size of the prime quills: but I still think that this point wants ascertainment, by reference to several mature specimens in known full plumage. Again, I would reiterate, that differences of colour are of no importance: my bird has no dark mark across the head.

V.—*Red-billed Erolia. By the same.*

[Regarding the present paper, it is our duty to bring forward the following facts. In November, 1829, Mr. Hodgson sent to the Asiatic Society (presented and acknowledged, in the Proceedings of January, 1830,) this description, and a coloured drawing of natural size of a Wader, which he called "the red-billed Erolia." It accompanied several other similar notices, which are published in the second part of the 18th volume of the Asiatic Researches. But by some accident, the Erolia seems to have been omitted and mislaid, nor can it be found among the papers handed over to ourselves, in 1831, by the late Mr. Calder, who had previously conducted the publication of the Physical Researches. The bird is a great curiosity, and has been very recently made known to the public

at home by Mr. GOULD as his discovery, although it is evident, that Mr. HODGSON'S description and drawing were produced two years before. Mr. HODGSON has only now had an opportunity of seeing the last volume of the Researches, which has prevented his bringing the unfortunate omission to our notice at an earlier period.—ED.]

Ordo GRALLATORES—Fam. CHARADRIADÆ—Genus *Erolia*.—Species New red-billed EROLIA.

As in the grallatorial order the Ibis links together the families of the Ardeidæ and of the Scolopacidæ, so that remarkable bird which I am now about to describe, admirably connects the latter family with that of the Charadriadæ. It constitutes besides a sort of central step in the long gradation, from the most typical to the most aberrant genera of the order of Waders—from those which have a great length of legs, as well as of bill, to those which are deficient in respect to the length of both. If to these interesting peculiarities belonging to our bird, we add that the genus has been but recently established, and that only one species is known, it will readily be allowed, our bird (which is moreover a new species) is entitled to a full and minute description.

Without objecting to the generic character, as established by VIEILLOT, I shall take the liberty to dilate it as follows:

Bill, long, slender, weak, but not soft; well arched; upper mandible, rounded at the base; grooved for $\frac{3}{4}$ths of its length; smooth and scarcely dilated or obtuse at its tip: lower mandible, rather shorter than the upper.

Nostrils, wide linear; placed in the membranous part of the groove of the bill, and near its base; shaded above and behind by the membrane; open. Face entirely clothed with feathers. Legs rather short, and having but little of the thighs denuded. Feet cursorial. Toes three, short; the outer connected with the central by a crescented membrane as far as the first joint: inner scarcely connected at the base; margins of the toes with the skin subdilated; nails short, obtuse, rounded.

Wings elongated, but not acuminated; longest flags nearly equal to greatest quills; first quill longest*. Tail shortest; even; 12 feathers. In further illustration of the characters of this bird, I may add, that the bill bears the strictest essential resemblance to that of the Curlew, scarcely differing from it at all, being rather more pointed or less obtuse at the tip, and somewhat more decidedly arched throughout. I speak thus from a comparison of the bills of three species of Curlew (which are now before me), with that of the bird in question:

* Since found to be a mistake, by comparison of all the specimens: but the first quill is not a *sixteenth* of an inch less than the second and third.—Note of 1835.

and had I not adverted to the generic character of the Curlew as stated in SHAW's Zoology, I should have conceived that the bill of our bird could not be more accurately characterised than by simply likening it to the Curlew's. SHAW, however, says, the Curlew's bill is long in the *superlative* degree, has its tip *dilated*, and the nostrils placed in a *short* groove.

Now I have only to say that of my three species, that emphatically called the long-billed is alone remarkable (considering what family these birds belong to) for length of bill; that all three have bills, which, without being quite so thick at the base as the Ibis' beak, have yet some thickness there, which grows gradually and uniformly less towards their tips; that their tips are scarce sensibly dilated; that their nostrils are placed in a groove which runs fully $\frac{3}{4}$ths of the length of the bill, although it is only towards the base or around the opening of the nostrils, that the sulcation is broad or membranous; and that lastly, all these peculiarities, which to my apprehension belong to the bill of the Curlew, belong likewise to that of the Erolia.

But for the decidedly Charadriadic character of its feet, not only its long slender bill, but its general appearance, figure, and manners would dispose us to range the Erolia with the family comprising the Curlew, Godwit, and Avocet; and indeed, embracing almost all the long feeble-billed Waders.

Few genera of the grallatorial order have legs so short or thighs so little naked as those of the Erolia: and in respect to the brevity of its toes and nails, still fewer even of the Charadriadic family of the order, and none I believe of the Scolopaceous family, match it. Its wings and tail have no peculiarity, and both are proportioned pretty much as in the Curlews, Avocets, and Godwits. The new species now before me (and which I propose should be called the red-billed) measures nearly one foot five inches from tip of bill to tip of tail, being in fact about the size and weight of the common Avocet. The particulars of its size, proportions, and weight are given in the sequel; meanwhile, I proceed to the description of its plumage. The whole of the head above and below, as far as the eyes, hind part likewise of the *crown* of the head, the chin and the throat, black, mixed with grey about the base of the bill; and the whole black space margined towards the body with white: rest of the body above, including the back parts of the head, the neck, wings, and tail, full ashy blue: great quills and false wing, dusky blue, and a large irregular bar of white across the wings: upper tail coverts, black, with an ashy powder: tail feathers, cross-barred with dusky, in the manner of the Curlews; and all the feathers, save the two centrals, largely tipped with black;

To Strigopidæ

the outermost tail feathers on either side having its outer web of a white ground colour, instead of a blue one, like the rest of the tail feathers and body above. Passing now down the bird's inferior surface, we have the chin black and the neck blue, as on the superior surface at bottom of the neck or top of the breast; a broad gorget of black, confined on the side towards the neck with a narrower band of white: rest of the body on this surface and wings and tail coverts, pure white: quills on this surface, white towards their bases: iris and bill, rich deep crimson: legs and toes, clear bluish grey, with a strong but irregular purplish tinge.

Dimensions and weight as follows:

	feet.	*in.*
Tip of the bill to tip of tail,	1	4½
Length of bill (in a straight line),		3¾
Ditto tail,		4½
Ditto a wing,		9⅛
Expanse of wings,	2	5½
Length of tarsi,		2⅝
Ditto of central toe and nail,		1⅝

Weight, 9½ oz. av.

The only specimen I have been able to procure was shot on the banks of a sandy stream in the valley, in October last; and it was apparently a mere passenger here, like the vast majority of the grallatorial and ratatorial birds which visit us, and which make only a stage of our valley on their way from the plains of Tartary to those of India, and back again.

[It is with much reluctance that we have been compelled to insert these two notices, without the beautiful drawings that accompanied them: but the number of plates inserted in the Journal hitherto, has been so great as to involve considerable expence, and to do justice to the present specimens, large and richly coloured, would have entailed a heavy additional charge. We have however the less regret in omitting them, now that we are informed of Mr. HODGSON'S intentions to publish the whole of his valuable illustrations of the Natural History of Nipal—a stupendous work, that will require to carry it through, as we feel sure its merits will command, the patronage of all cultivators and admirers of the Fauna of India, here and at home. Having had enquiries from several quarters as to the probable extent, and as to the contents, of Mr. HODGSON'S proposed work, we have obtained from that Gentleman a Catalogue of the Drawings already sent home, to be put into the Publisher's hands, which shall be inserted, if possible, in the next No. of the Journal.—ED.]

VI.—*Hints for the Preservation of Objects of Natural History.* By J. T. Pearson, *Esq. Curator As. Soc. Museum.*

Preparations of natural history have two great enemies: insects and damp. The latter requires great and constant attention to prevent: the former are combatted by what are called preservatives. The preservatives in common use are preparations of Corrosive Sublimate and Arsenic.

Of the former, a very good preparation is made by merely dissolving a certain proportion in spirits of wine. For common purposes, such as the preservation of the soles of the feet, or inside of the mouth of animals, a scruple of corrosive sublimate may be dissolved in one ounce of the spirit; but for the finer operations, where the colours of insects and feathers, &c. are concerned, two grains of corrosive sublimate to an ounce of spirit, will be strong enough: made of this strength, the solution dries without leaving a white crust of crystals on the specimen; while it will prevent the attacks of insects, and even mouldiness, if ordinary care be taken to keep the specimens dry.

Another preparation of corrosive sublimate and arsenic, together, is recommended for the preservation of insects. Its composition is as follows:

Take of arsenic in powder, one ounce.

Corrosive sublimate, one ounce.

Spirit of wine, three ounces.

Spirit Sal Ammoniac, or Spirit Ammonia, one ounce. Mix them well together, and keep them in a bottle, labelled "POISON," for use.

But of all the preparations used for the preservation of the skins of animals, the arsenical soap, invented by Becœur of Mentz, is the most celebrated and most useful. It is made thus:

Take of Arsenic in powder, 2 lbs. White soap, 2 lbs. Salts of Tartar, 12 oz. Lime in powder, 4 oz. Camphor, 5 oz.

Cut the soap into thin slices, and melt it in a little water or spirit of wine over the fire; then add the salts of Tartar and the lime. Take the mixture off the fire, and add the arsenic, taking care to mix it well by trituration in a mortar, or other convenient vessel; and when nearly cold, mix in the camphor, previously reduced to powder by the help of spirit of wine. When thus made, keep the arsenical soap in a glazed earthen pot, or a wide-mouthed bottle, and when used, dilute it with water to the consistence of cream.

The principal materials for both the above preparations may be procured in every bazar in India.

Mammalia.

The parts of Mammalia, (or those animals which suckle their young,) which are at once the most interesting to the naturalist, and the most easily preserved by the unscientific contributor to a museum, are the skin, and the skeleton or bones. All parts, however, are very useful, though there is some difficulty, to a person not accustomed to dissection, in preparing them.

When an animal of but a small size has been procured, such as a mouse, bat, rat, or even a squirrel, hare, or porcupine, the best mode of sending it to a museum is by placing it in a glazed jar, a large, wide-mouthed bottle, or a small barrel, with a large bung, filled three parts full of spirit of wine, strong gin, very strong bazar arrack, or any other ardent spirit, though on account of their not coloring the specimen, these are the best. A small hole should be cut into the belly of the animal before it is put into the vessel, to allow of the spirit entering freely into the internal parts, to preserve them. When a sufficient number of specimens have been placed, a wooden tally should be affixed to it, with a number cut thus

| oXXV. | oXL. | referring to a book, in which all the peculiarities of age, sex, color of the eyes, form of the iris, if round or oval, height, length, size in general, locality, &c. should be carefully noted; close the vessel carefully with moistened bladder over the cork, or bung, and cement it all over with a composition of bees' wax, rosin, ruddle, and turpentine; or common bazar sealing-wax may be used in default of any thing better, melted with enough very finely powdered brick-dust, to make it set hard.

Bones. The skeletons or parts of skeletons of mammalia, birds, and reptiles require but little knowledge or trouble to prepare them. The animal, or such part of it, the bones of which it is intended to preserve, should be skinned, and as much of the flesh as can be readily cut off, should be removed. The bones are then to be placed in a convenient vessel, such as a barrel, for large specimens, and a jar, or even a bottle, for small ones; and water enough poured into it, to cover them well up from the air. Close the vessel, and leave it for a longer or shorter time, as may be necessary, for the complete maceration of the bones; till the remaining flesh and ligaments will strip off with such ease, that the pouring a stream of water from a height of four or five feet upon them, will be sufficient to remove them. When freed from flesh and ligaments, the bones should be put in the sunshine to dry; and when well dried, they may be at once articulated, or packed in cotton or saw-dust, to prevent their rubbing against one another and being injured by carriage; and in this case the sooner they are sent to their destination the better.

In macerating bones, it is necessary to take care that the water always covers them, otherwise they will become indelibly black. The flesh must never be scraped off, or the specimen may be injured.

In washing bones after maceration, care must be taken that those parts which have become loose are not lost. This is likely to happen with the incisor, or front teeth; and with those bones, which, in young animals especially, are united to the other parts by ligament and by cartilage or gristle. All such detached parts should be taken off, cleaned, and put bye in a small box or bottle, and labelled with the name of the animal of which they formed a part.

As this method is attended with some trouble, and cannot be followed by persons not stationary, and as it separates the bones too much from one another to allow of their being sent to a distance without risk of losing some of them, it may be as well to mention another: which, indeed, has been printed and circulated in a separate form, along with a few more hints of the same kind. In this process, skin the animal, and cut off all the flesh from the bones as clean as can be done, *without scraping* them. Separate the fore legs, with the shoulder blades, from the body, and the hind legs, by taking the thigh bone out of the socket at the hip. Cut off the head close, between it and the first joint of the neck; and allow it to remain in water for a few days, when the brain may be washed out by directing a stream of water from a *bhisty's mussack*, or earthen pot, into the foramen magnum, or hole of the spine. When cleared of flesh, hang up the skeleton to dry in an airy place, but do not separate the bones from one another more than is mentioned above. And when dry, pack it up in cotton, tow, or saw-dust, in a strong box, for transmission.

Skins of Mammalia may be preserved by attending to the following directions. After the death of the animal, let it remain an hour or two in a cool airy place, to allow the blood to congeal. Then lay it upon its back, and make an incision in the skin from between the fore legs, along the abdomen, to half way between the navel and the vent. The hind legs are then pulled out gently, bending them at the knee or stifle joint, and cutting them out of the socket at the hip. Cut off the tail close to the rump, and draw out the body through the opening in the skin, as far as

the shoulders, which separate at the shoulder-joint, and continue to draw out the body; an dcut through the neck as close as possible to the head, between its first joint and the skull. Next pull out the legs as far as the fetlocks, either by the hand alone, or, as in large animals may be necessary, by fastening a cord to the bone, and attaching it to a hook in the wall, or a cross-beam, and then pulling down the skin. When skinned, cut off all the flesh from the leg bones, smear them well over with arsenical soap, wrap them in a little cotton or tow, and return them into the skin.

The head is next to be skinned very carefully, as far as the corners of the mouth, taking the greatest care not to cut the eyelids when the eyes are come to, and not to separate the lips from the gums; and the ears must be cut off as close to the head as possible. If the eyelids are cut, and the lips separated from the bones of the jaws, the specimen never looks well when set up; and if the ears are not cut off as close as possible to the head, they appear shorter than they ought to be. Having so far skinned the head, it must be left hanging to the skin; the flesh must be carefully cut off as clean as possible, the eyes taken out of their sockets, and the brain picked out with a hooked wire, or flat stick, and pair of forceps, through the foramen magnum, or hole for the spinal marrow at the back of the skull.

The next process is to smear the whole inside of the skin well over with arsenical soap; taking care to put some also upon the bones, and joints of the legs, and inside the skull, sockets of the eyes, mouth and nose. The balls of the feet and toes should have an incision made into each, and be well stuffed with arsenical soap; and a little should be put upon every part of the body which is naked of hair.

If the skin is very fat, as is the case with almost all the water animals, especially those of the dolphin, porpoise, halicore, otter, seal, and other cetaceous and amphibious genera; the fat must be all removed, and the skin rubbed over with powdered chalk or whiting, before the arsenical soap is applied. A little chopped cotton or tow should next be placed inside the head, and along between the skin and bones of the legs, face, &c.; and just enough in the body of the animal, to keep the sides of the skin from sticking together. The operation is now completed, excepting the skinning and stuffing of the tail.

The skinning of the tail is sometimes a more difficult business than all the rest put together. The stump of the tail must be fastened to a strong string, or in large animals, a cord, and the string tied to a beam, or hook in the wall, so as to bring the tail about on a level with a man's elbows, so that he may have full power over it. Two sticks, with a square edge on each, but the edges not so sharp as to cut the skin, must be applied, one on each side of the tail, and tied so as to inclose the stump between them. They are then to be taken hold of on each side, and forced down the tail, separating the skin from the flesh and bones, as they descend. This process prevents the skin from being turned inside out; which it is well to avoid, for it is very difficult, and sometimes impossible to get it right again. The skin of the tail is to be well smeared inside with arsenical soap, and a very small quantity of tow, or a small rope may be introduced by means of a split rattan, to keep its sides apart.

When the skin is thus prepared, it must be put in a cool airy place to dry, and after a day or two, it may be set in the sunshine. In damp or wet weather, however, it is better to put it in the sun immediately after being prepared with arsenical soap, otherwise the epidermis or scarf skin is liable to come off, and bring the hair along with it.

Care must be taken that skins thus prepared are well dried; and they should be sent off to be set up, as soon after they are dry, as possible. If

kept for any length of time, they ought to be frequently sunned, and always kept in an airy place, instead of being, as is too often done, shut up in boxes. It is the notion that zoological specimens must be excluded from the air, that has given rise to another notion not less absurd, that they cannot be kept in India. The experience of some collectors is to the contrary. And any person may analogically test it, by observing whether paper, clothes, &c. are mildewed most, when shut up, or not.

When an animal has been skinned and stuffed as above, there are still many parts of the body that are valuable to the comparative anatomist and to the zoologist. The bones of many animals are very valuable, and those of new and rare species should always be preserved for examination. The internal parts also of such species should be put into spirit and kept: the parts most useful are, the thoracic and abdominal viscera, particularly the heart and stomach; the organs of generation, external and internal; and the trachea, tongue and larynx.

The importance of affixing tallies to every specimen, and making notes and memoranda concerning it, cannot be too much impressed upon the mind of the collector. Every collection derives additional value from its having a good catalogue attached to it; while without such a catalogue, the best preserved specimens are often quite useless in a scientific point of view. As before said, the age, sex, size, height, length, circumference, locality, manners, colour of the eyes, form of the iris, and, in short, every thing peculiar about the animal, should be noted with the greatest care.

Birds.

In birds the skinning process is still more easy than in mammalia; though, as feathers are not so readily cleaned as hair, greater care must be taken not to soil them.

Birds are best procured for the purposes of natural history, by the gun. Those caught either in nets or by bird-lime, or any other means, are generally more or less injured in their plumage. To prevent as far as possible the feathers being soiled by the blood, the shot, with which the gun is charged, should be as small as is compatible with the size of the bird to be brought down, and the quantity of powder should not exceed half the usual load; in short, just enough of both shot and powder should be employed to bring down the bird. If the bird is only wounded, it should be taken hold of firmly under the wings, when by squeezing the sides of the body together, it almost instantly dies. When dead, the feathers over the wound should be blown aside, and a pledget of fine cotton placed upon it, to absorb the blood as it oozes out. Another pledget should be placed on the vent, and a quantity, proportionate to the size of the bird, must be put into the mouth, to prevent the blood of the wounded internal parts from coming out of the throat. The bird is then to be carefully wrapped in a handkerchief, taken home, and hung in a cool place.

After being allowed to hang for three or four hours, to allow of the coagulation of the blood, the skinning process may begin. The bird is laid upon its back, with its head towards the left hand of the operator; the feathers are carefully laid aside, and an incision is made from the fore part of the chest above the merry-thought bone, along the breast and abdomen, to midway between the breast bone and the vent. The skin is carefully pushed aside with the handle of the scalpel, or the fingers and thumb of the operator, backwards over the shoulder-joint, or that joint where the wing joins the breast; an incision through that joint is then very carefully made, (taking the greatest care to avoid cutting the skin of the back,) so as to separate the wing from the body, and a similar process is gone through on the other side. After having proceeded thus far, it is necessary to introduce some cotton between the skin and the body of the bird, to prevent the feathers from being soiled; and in fat water birds, the parts should be well sprinkled with powdered chalk. The mouth is next to be opened, and a pair of scissors pushed back into it, so

far as to enable them to embrace each side of the neck, and cut the vertebræ or neck bones through as close as possible to the head. A hook is then introduced into the fore part of the incision on the breast, so as to catch hold of the neck; when the bone may be readily drawn out, without disturbing or injuring the feathers of the neck. A string is now to be fastened to the vertebræ of the neck, and the bird hung up to a hook in the wall, or any other convenient place, and the skin very carefully drawn off the back. It should be pushed rather than pulled, and with the fingers and thumb nails rather than with the knife. Indeed, the less the knife is used in skinning birds the better. Unless very great care is taken, the skin will here be torn; for on the back it is very tender, particularly so, indeed, in some of the hawks and pigeons. When the hip joints are come to, the thighs and legs must be pushed up, so as to allow of their being cut off at the joint next to the hip-joint, leaving what is generally thought to be the thigh, but which is, in reality, the leg, attached to the skin. The skinning then proceeds down to the rump, and the skin is finally separated by cutting through with a strong pair of scissors the rump bone in the middle, leaving at least half of that bone attached to the skin.

In cleaning the head, the tongue and trachea, or wind pipe, attached to it, must be drawn out; and the gullet or œsophagus also, if that part has not been previously removed by the withdrawal of the neck. A pair of sharp-pointed scissors must be run through the top of the inside of the mouth into the brain, first on one side the head and then on the other, so as to cut a triangular flap in the base of the skull. This flap is then to be detached by seizing and twisting it out with a pair of forceps, long and slender, like those in the common dressing case of a surgeon. The brain is then easily removed through this opening, by means of forceps; a bit of wire bent into a hook, and cotton wrapped round the end of the forceps into a ball to wipe it out. When the brain is removed, the eyes are to be taken out: and this is done by introducing from the mouth a hook formed like the hook found in the anatomist's dissecting case; by means of which, the eye is laid hold of and pulled inwards; taking care, at the same time, to detach it, by cutting the skin or folding of the outer coat of the eye, from its connections with the eyelid; and this must be managed carefully: for if the eyelid is torn, the head of the bird on that side never looks well when set up. The inside of the skull and eye-holes are to be well wiped out with dry cotton, and smeared with arsenical soap; after which, a pellet of cotton should be introduced into the eye-hole, and the eyelid closed accurately over it, so as to preserve the roundness of the part. A small quantity of cotton, dipped in arsenical soap, must also be put into the cavity of the head.

When the body has thus been removed from the skin, the wings are to be skinned as far as the first joint from the shoulder; and in a large bird, a little beyond. The flesh is to be removed from the bones of the wing, and the bones smeared over with arsenical paste, and covered with a small quantity of tow, dipped in the same substance. The legs are to be treated exactly in the same manner as the wings, skinning them as far as can be done without injuring the feathers.

When the bird is skinned, the skin must be smeared all over with arsenical soap, on the inside, especially about the rump and wings, where a good deal of flesh always remains. The inner side of the wings along that part of the bones not skinned, and the inner sides of the pinion, must have a small quantity of a solution of corrosive sublimate in spirits of wine, put upon them with a camel's hair pencil. For birds with a colourless plumage, it matters little of what strength this solution is made; but for those of the more delicate colours, two grains of the corrosive sublimate to one ounce of spirit will be enough; and this strength should not be exceeded, or the colours may be injured. A certain quantity of cotton is next to be put into the neck and body of the bird; the plumage

should be smoothed down; a cone of paper, with the top cut off, to allow of the protrusion of the bill, is then made, and the bird put into it, and hung up to dry.

In the above process, there are some points in which the common rules of preserving the skins of birds are departed from in the following particulars: in the first place, the skinning process is different from that generally followed, in as much as the skin of the neck is never everted in this as it is in the common way, so that all the stretching of the skin and derangement of the feathers, which invariable accompany the other plan, are avoided; and the inconvenience arising from which, in birds having large heads and slender necks, is very great: so much so, indeed, that in some birds, it is impossible to draw the head through the neck, and the making an incision, even, at the back of the head has been recommended. The rump is only half cut through, instead of being taken almost entirely out, whereby the feathers of the tail are faster and are carried better than they otherwise can be; and if plenty of arsenical soap is used, no inconvenience follows from this. The wings are less deranged than in the common way; and by commencing to take off the skin from the fore part of the bird, there is less danger of damage to the feathers from blood, oozing from the inside, than if the hinder part is skinned first. By the eye too being taken out from the inside of the mouth, the feathers at the side of the head, which generally are of delicate colours and structure, are not so frequently injured as by their being removed through the eyelids. Upon this point it may likewise be remarked, that the eye may be left in altogether, if the cornea is touched with the before-mentioned solution of corrosive sublimate in spirit of wine: and when the specimen is dry, the eye may then readily be cut out, and a ball of wet cotton put in its place; and the eyelid becoming soft, may be arranged as before.

Before a bird is skinned, it is well to notice several points that may be useful to the naturalist, as well as to the person who eventually stuffs and sets up the skin.

The colour of the eye should be noted down, taking care to define the shade as accurately as possible. The weight of the bird, its length, from tip of the bill and crown of the head, to the end of the middle toe, to the rump, and tip of the tail, should be taken; as well as the expansion of the wings. If there are any naked parts about the base of the bill, or the head, their colour must be particularly noted, as the colour of these parts is apt to change, as will indeed sometimes that of the bill and legs: these latter therefore should be mentioned too. In short, every thing that strikes the observer as peculiar about the bird, should carefully be noted down.

Reptiles.

In the preservation of reptiles, no great trouble is required. When taken, every thing likely to interest the naturalist, or any future observer, it is well to record; while their dimensions and weight should always be mentioned. They may be divided into three kinds for the purpose of this essay. 1st, Chelonian reptiles, or those having a hard covering, as the tortoises; 2nd, four-footed scaly-skinned reptiles, forming the Lacertan or lizard tribe; 3rd, the Batrachians, or frogs and toads; 4th, Serpents.

Chelonian reptiles are best preserved, by carefully removing the inside by an incision made in the soft parts, by the side of the fore or hind legs; though in some, particularly in large specimens, it is necessary to separate entirely the upper shell from the lower, cutting through the hard parts at the sides, before the inside can be removed. The less disturbance, however, of the shell, the better, and the less the bones are deranged, the greater the use of the specimen. When the inside, or so much of it as can well be got out, is removed, the shell should be smeared on the inside with preservative, and the outside may be brushed over with the corrosive sublimate solution. The brain of reptiles is very small, and enclosed in a hard long case; and it matters not much if it is removed or not, as

enough of the preservative penetrates to that organ to prevent injury to the surrounding parts, if the mouth is well filled, and an iron rod or skewer employed to pierce the various parts of the head from the mouth. Some reptiles of this order have long necks; in them the neck may be skinned through an incision made in the lower part, where the neck joins the chest; but when the shell is removed, there is no difficulty in skinning the neck through the opening that is necessarily made.

Chelonian reptiles may be stuffed with cotton, like mammalia, for the purpose of conveying them from one place to another.

The larger lizards, crocodiles, alligators, &c. must be skinned and stuffed, and treated in all respects as mammalia. The smaller may be put into spirit.

Frogs are very difficult to deal with: they are hard to skin and stuff; and when done, the colours for the most part fade. In spirit, the colours fade also, but not so much, perhaps as when preserved dry, while the form is kept better.

Toads are generally of a sombre colour, and keep pretty well either stuffed or in spirit.

It is not an agreeable thing to stuff a toad. It is done by putting a sharp-pointed pair of scissors into his mouth, cutting through the spine, and drawing it, and the whole of the inside, out through the mouth. The thighs and fore-legs are to be separated from the rest of the skeleton, and replaced in the skin; or if time is allowed, the skeleton itself may be denuded of all the soft parts, and replaced in the skin: and the skin is then to be filled by the mouth with sand. The feet should be fastened down with pins to a bit of card or soft wood, and the preparation put to dry: when dry, a hole should be made in the belly, to let out the sand, and it should be varnished with some good hard, colorless varnish: copal perhaps is the best*.

Very large snakes may be stuffed as mammalia are, taking care, however, not to fill the skin so full as is generally done. The size of the artificial body should be as near possible that of the natural one. Small snakes should be kept in spirit of wine.

Fishes.

Fishes, if small, may be put into spirit of wine—if large, they must be skinned, very carefully, and stuffed. It is an easy way of stuffing fish, to make an incision along the side of the dorsal or back fin, laying the fish open from end to end. The back bone, and all the inside, is then to be taken out as close to the skin as may be, without cutting it; the arsenical soap is applied well over the inside, the incision sewed up, and the skin filled with sand by the mouth. When full, the mouth should be opened or shut, according to the position it is wished for it to remain in—a wire, twisted into a tripod at each end, is placed to support the fish, and allow it to dry; and when nearly dry, it must be varnished, with the same varnish as that recommended for reptiles; by which means, the colours are pretty well preserved. When the fish is quite dry, the sand must be poured out at the mouth, and the specimen is ready to be sent to its destination.

Crustacea.

Crustacea are found in various situations. Some are to be met with in the nets of the fisherman; some, as the sea crabs, may be caught by a line, baited with a muscle; others are found running about the sides of tanks, rivers, and shores of the sea; and others again, the parasitic crustacea, in various situations about the bodies of animals, especially on the gills of fish, or fixed on their bodies.

* Good copal varnish for this purpose is made by digesting powdered gum copal, without heat, for 48 hours, in spirit of turpentine: pouring off the clear turpentine, and allowing the varnish so made to evaporate in the sun to the proper consistence. By repeated digestions with turpentine, the whole of the copal may be dissolved, if pure; and the dissolution may be assisted by adding a little camphor to the turpentine, before pouring it upon the gum.

Crustaceous animals, such as crabs, lobsters, cray-fish, &c. may be all preserved in spirit of wine, but they generally lose their colours. Small ones may be dried as they are, but the larger specimens require to have the inside removed. Crabs are readily cleared, by taking off their shell, and drying it separated from the body, which has been previously freed from all the soft parts it contained. The corrosive sublimate solution is the best thing for the outside of crustacea, but arsenical paste should be smeared within. Great care is requisite to prevent crustacea being injured in drying, and they should be carefully packed in a good quantity of cotton, or the legs or antennæ will assuredly be broken.

Crustacea may be killed, if altogether breathers of water, merely by taking them out of that element. If partially or wholly livers upon the land, spirit of wine kills them readily enough. But care must be taken in handling some of them; for the crabs in particular make nothing of casting off a leg or two, with as much ease as a lizard does his tail.

INSECTS.

The class INSECTA contains a vast variety of animals. The mode of preserving them, however, is very much alike in all.

Insects are found in so many situations, that it is impossible to particularize more than a few. Upon and within vegetables living and dead; between the bark and the wood, and in the trunks and holes of trees; in the loose earth at their roots; under stones or logs of wood that have long been lying on the ground; at the roots of grass; between the leaves that grow close along the stem of some plants, as the plantain, sugar-cane, and many of the grasses; in bones and horns, both within their hollow cavities and in their substance itself. Dead carcases of animals and putrid animal matter of all kinds contain some very beautiful specimens: and some of the finest kinds are found in water, both stagnant and running; in short, it is more easy to tell where insects may not be found than where they may.

Insects that feed upon trees and high shrubs, may be caught by placing a table cloth beneath, and beating the branches with a pole; when the insects are shaken down upon the cloth, and easily seen. A white chattah answers the same purpose almost equally well with a table cloth, and is more convenient to carry; besides being serviceable in another way. They are easily taken in a net made of curtain gauze formed like a cabbage net, and fastened to a hoop at the end of a long stick. By making the handle of your net with joints like a fishing-rod, you are enabled to reach the higher branches. In using this net, which is well adapted for butter-flies, dragon-flies, bees, wasps, and other insects that are caught on the wing, a peculiar turn is given to bring the tail part of the net over the handle, doubling it on the rim; by which means the prey is prevented from escaping. Another net may be made to fold up, having two poles or handles on each side, made of bamboo, or other easily bending wood: these handles are straight until near the top, when they are bent off at nearly a right angle, and fastened together with a string, or two pieces of wire, looped together to form a hinge: the lower part of the side poles are fastened together at a proper distance, say two and a half or three feet, with a small cord, leaving enough of the lower ends, to form handles, by which to use the net. The whole is then to be covered with gauze, from the upper end down to the cord below, when the net is complete. To use it, little skill is required; one handle is taken in each hand, and it is held up open, against any insect it is wished to catch, and shut up by bringing the handles together quickly, when the insect is secured between the fold of the gauze. Large pincers with loops or rings, and with gauze between their loops, are also used; but the common nets, described above, are the best; and, indeed, all that are necessary. Coleopterous insects, or beetles; Hymeropterous, or wasps, bees, &c.; Hemipterous, or bugs, &c., and, indeed, all others, save the Neuroptera, or dragon-flies, an d the Lepidoptera, or butter-flies, moths, &c. when caught, are to be put into a bottle containing a little spirit of

wine. But those which have any particular marks of delicate colours, and those whose colours depend upon a powder strewn over them, must not be placed in spirit, but alive into boxes; and it is best to put but one insect into each box. Butter-flies must be taken between the thumb and finger, and pressed at the sides of the thorax, just under the wings, when they almost immediately die. Dragon-flies may be killed in the same manner.

When the insects are brought home, those kept in the spirit should be taken out, and if of sombre colours, placed in a solution of corrosive sublimate for an hour or two, when they may be put upon pins, and made ready for preserving them. Those insects that cannot be placed in spirit, on account of their delicate colours, &c., should be taken out of the boxes, and put into a glass, or a wide-mouthed bottle, and the glass or bottle with the mouth closed may have a bit of camphor or a drop of æther, or a bit of carbonate of ammonia put into it, placed in a basin of hot-water, when they soon die. Prussic acid has been used for the same purpose, and its effects are said to be instantaneous: but its employment may be dangerous to the operator, if great care be not taken.

When an insect is dead, it should be smeared over the under surface with arsenical soap, or LATREILLE's preservative, the preparation of which has been given before; a pin, proportioned to its size, must be run, if a beetle, through the right elytrum or wing-case, and brought through the under side, between the second and third leg; and then it must be placed in a box or drawer. Other insects of all kinds should have the pin run through the thorax, or piece of the back, just in front of the elytra, and brought out between the legs below.

As a mere collector's cabinet, one convenient enough for the purpose may be made of any box; a French claret box, for instance, answers quite well enough, if provided with a close lid, to prevent ants and cockroaches from entering it, and fitted up with trays to run in grooves about $2\frac{1}{2}$ inches apart. The bottom of each tray must have a flat piece of solah well pressed; or a layer of cork, about $\frac{1}{8}$ of an inch thick, covered with paper, fastened on to it, will be better still, in which the pins, with the insects upon them, are to be stuck: or the top, bottom and sides of the box may be lined with solah or cork, so as to do without trays or drawers at all. Every fine day this box should be placed in the sun, to dry the specimens; taking care to keep the lid shut, that the light may not enter: for light destroys the more delicate colours of insects. With these precautions, insects may be kept for any length of time: for when once well prepared, the only thing requisite is to keep them dry.

Some very small insects cannot be run though with a pin. These should be placed upon a triangular piece of quill, cut into this form ▷, the sharpest angle being introduced into the insect at its underside, between two of the rings of the abdomen. A pin is then run through the broad end, and the whole stuck in to the box thus ⊳—. This is an improvement upon the plan hitherto recommended, of pasting the insect upon a triangular piece of card, inasmuch as it not only looks better, but it allows the under part of the insect to be seen, instead of hiding the characters of that part, which in some genera are very important.

Spiders are difficult to preserve, without their losing their plumpness and beautiful colours. Spirit of wine has been recommended, and when it is used, a good many may be put into a bottle together. If it is wished to preserve them dry, they may have the inside of the abdomen squeezed out, through a hole made in their under surface, and the cavity filled with very finely chopped cotton, or with sand; and then they may be pinned into the boxes. LATREILLE recommends that the abdomen be cut off from the thorax, stuck upon a stick, and introduced into a bottle, fastening the stick into the cork, so as not to touch the sides, and holding the bottle over a lamp or fire, till the specimen becomes dry, which is then stuck on the thorax again. Any of these plans will do with some of the

To Syngapoulan

genera of spiders, tolerably, but none of them answer well. Caterpillars are in the same predicament as spiders, though a method of preserving them in all their beauty is said to have been discovered by Mr. ABBOTT, of Georgia, which seems to have been lost at his death.

MOLLUSCA.

Those animals which, as their name imports, have soft bodies, and which, for the most part, are covered with a true shell, are divided into two kinds: those which inhabit the land, and those which live in the water. The latter are again divided into fresh and salt-water Mollusca; and a third portion seems to dwell in marshes, the estuaries of rivers, &c., forming an union, as it were, between the other two. The fresh-water Mollusca are found in tanks, running streams, and watery places of all kinds, either lying at the bottom, or floating in the midst, or attached to weeds, stones, and other extraneous substances. Salt-water shells are found in similar situations in the sea; some bury themselves in the sand, which is covered at high-water by the tide; while others may be found floating along upon the surface of the waves; and dead specimens lie scattered upon the shore. Marsh shells are to be met with in the estuaries of rivers and in wet places, whenever the salt-water mingles with the fresh.

The localities of land shells or snails, as they are generally called, are numerous. These shells are to be found upon the trunks and branches of trees, and lying or creeping beneath them; others are hidden under stones and pieces of timber, or weeds, or other vegetable matter. The best season to procure them is in the rains; and they are not found in abundance saving in moist places.

Having learnt the localities of the various kinds of shells, no great skill is needed to procure them. Land-shells may of course be picked up with the hand, and taken home in a box: fresh-water shells, by looking for them in their dwelling places, and by dredging them up by a net. Sea-shells are dredged up by nets, having a kind of strong rake attached to the front, to rake them from the bottom; when by continuing to draw on the net, the shells fall into it and are caught. Pelagian shells, those that swim upon the waves in the middle of the sea, are procured by a kind of small net, that is towed in the wake of a ship, or cast by a dexterous hand upon the floating animal from the deck. It is in the form of a cabbage net, about a foot and a half in diameter, with a rim round the top, made heavy with shot; and fitted with a long line, to allow of its being towed, or pulled in again after it has been thrown.

When procured, put the shells into boiling water, and boil them for a few minutes, to kill the animal; so that it may be removed in the spiral shells with a small hook, or a crooked pin: the animal of the bivalves may be taken out easily enough with the fingers, or a pair of forceps. But some of the very long spiral shells require to be left in water till the animal becomes so putrid that it may be washed out. The shell should then be cleaned with soap and water, dried, and kept in a box. In cleaning shells, great care must be taken not to break or injure their margins or mouths; and in land-shells, particularly, not to scrub off, or otherwise remove the epidermis, or skin-like substance that covers them.

Each kind of shell should have a box to itself; and the box must be numbered, or the number may be written upon the shell itself, if it is large enough to allow of that being done. The numbers should refer to memoranda of the locality, kind of animal, or any other interesting particular concerning the specimen, that may be known to the writer.

By carefully following these directions, a zoological collection may be made, that will, with tolerable care being taken of it, keep in any climate. The mounting, as it is called, or setting up the skins of birds and beasts, to look like the living animals, is another branch of the subject; and one that can be followed only by persons stationary, and with success, after long practice; but as it is the step, to which the foregoing instructions have been but preparatory, a few hints on that head will hereafter be given

VII.—*Proceedings of the Asiatic Society.*

Wednesday Evening, 2nd September, 1835.

The Honorable Sir Edward Ryan, President, in the Chair.

Mr. F. Corbyn, proposed at the last meeting, was balloted for, and duly elected a Member of the Society.

Messrs. H. Piddington, E. Dean, and C. Brownlow proposed at the last meeting, were upon the favorable Report of the Committee of Papers, elected Associate Members.

The Secretary brought up and read the following Draft of a Memorial to the Honorable the Court of Directors, prepared by the Sub-Committee, nominated at the Meeting of the 1st July last.

"*To the Honorable the Chairman and Court of Directors of the East India Company.*

The Memorial and Humble
Petition of the Asiatic Society
of Calcutta,

Sheweth,

That the Asiatic Society, as your Honorable Court is aware, was instituted in the year 1784, for the purpose of "Enquiring into the History, Civil and Natural, the Antiquities, Arts, Sciences, and Literature of Asia."

That since its institution, its exertions have been continually directed to the above objects; that it has numbered amongst its members all the most distinguished students of Oriental Literature; and that it has succeeded in bringing to light many of the hidden stores of Asiatic learning, and in drawing and keeping alive the attention of your Governments in India, to the great importance and advantage of such researches.

That it was soon discovered, however, that mere individual efforts, or even the combined exertions of individuals, might, indeed, keep alive the spirit of inquiry, but could do little to diffuse amongst the people themselves, the knowledge of their ancient languages and literature, in which the whole of the legal and religious institutions of Hindusthan were embodied and preserved, and which, at the date of the introduction of British rule, were found in the exclusive possession of the priesthood, guarded with jealous monopoly as a means of influence and emolument, and doled out and interpreted to the uninitiated, as it suited their prejudices and interests. The public aid and encouragement of the existing Government was wanting to supply the resources formerly derived from the bounty of the native princes and nobles, which had shrunk in proportion as the British dominion advanced; and the necessity of it became at length so urgent, as to force itself upon the notice of the local authorities. Your Memorialists have only to refer to the recorded minute of the Right Honorable Lord Minto, Governor General, dated 6th March, 1811, a copy of which is annexed.

That the British legislature, upon the occasion of the renewal of the Charter Act of 1813, (53rd, George III. c. 55,) made an express provision, that "a sum of not less than one lakh of rupees, in each year, should be set apart, and applied to the revival and improvement of literature and the encouragement of the learned natives of India, and for the introduction and promotion of a knowledge of the sciences among the inhabitants of the British territories in India."

That in pursuance of the above enactment, the Supreme Government, accordingly, set apart the amount prescribed, which was appropriated, conjointly with sums previously granted by Government and other private endowments, partly towards the support or enlargement of the Sanscrit and Hindu Colleges of Calcutta and Benares; the Muhammedan Colleges of Calcutta and Delhi, the establishment of English Schools in these and other places; and partly towards the publication, as well of standard works, in the Sanscrit and Arabic languages, as of translations of English

works into those languages, a list of which is hereto also annexed, showing what works have been completed, and what are still unfinished. That this appropriation continued until the 7th of March, 1835, when, by an order of the Supreme Government, a copy of which is annexed, the whole of the works then in progress, and of which the particulars are therein given, were suspended, and the funds before devoted thereto, as well as those which should occur from the eventual reduction of the Sanscrit and Arabic Colleges, ordered to be employed exclusively, "in imparting to the native population a knowledge of English literature and science, through the medium of the English language."

That the Asiatic Society, considering the public and complete withdrawal of all support, from the funds of Government, to the revival of the ancient literature of the country, as a measure fatal to the objects and principles, the advancement of which they had so long been labouring to promote, were induced, by the urgency of the occasion, to make a humble representation to the Government upon the subject: but that their endeavours were ineffectual, as will appear by copy of the Memorial and answer also annexed.

That it is with regret and reluctance that your Memorialists are compelled for once to step beyond the immediate objects of their institution, and to become appellants to the liberality and justice of your Honorable Court.

That your Memorialists do not presume, for a moment, to question, either the discretionary power of the Supreme Government to apportion the Parliamentary grant in question, to such objects as to it shall appear the most deserving, or the soundness of the construction it has put upon the terms of the statute; still less is it their wish or intention to obstruct or depreciate the noble project of diffusing amongst the natives of India the knowledge of the language of their rulers, and thus enabling them, by their own efforts, to naturalize amongst themselves the arts and the sciences and the literature of Europe. But inasmuch as the entire subversion of the national language is a project neither contemplated nor possible, they humbly submit, that the diffusion of the English language is manifestly but one step towards the common end in view; that the study and improvement of the languages of the country is a step of at least equal importance, and that no means have been yet suggested so likely to forward that study and improvement, as the revival of the ancient languages and literature, the objects still of popular veneration—the source of all that is intellectual or valuable in the mixed dialects now in use, and the only model to recur to for their amendment or purification.

That, so long as the laws of the Hindus and Muhammedans shall continue to be the rule of judicial decision upon the rights of property, it is surely essential to the due administration of justice, to render the repositories of those laws generally accessible; so long as their religious system shall not be merely tolerated but protected, it is surely a matter of urgent consequence to facilitate the access, not of the people only, but of their rulers also, to the volumes that contain their tenets; and if the advancement of knowledge be regarded as the introduction to a purer faith, and higher tone of moral feeling, your Memorialists would urge, that no measure can be more effectual for the destruction of the sanctuaries of superstition, than that of rending the veil of mystery and ignorance, that has hitherto concealed its deformities.

That if the Governments of India had never stretched out a helping hand to foster and diffuse the knowledge of Asiatic literature, your native subjects might have regretted the apathy of their rulers, yet could not have complained, either of caprice or of abandonment. But thus to withdraw the support which it had for at any period afforded, appears to

be such a destruction of their hopes, as the experience of British rule had by no means prepared them for. And your Memorialists are well assured, that if your Honorable Court shall deem it inexpedient to alter that appropriation of the Parliamentary fund, which the local Government has determined upon, you will readily and cheerfully devise some other means of continuing that encouragement to the cause of Asiatic literature, which reflected honor on the hand that dispensed it.

Your Memorialists, therefore, humbly pray, that your Honorable Court will be pleased to continue the encouragement hitherto afforded to the revival of learning among its native subjects, and to direct that such reasonable sum may be supplied from the territorial revenues, as may be sufficient for promoting amongst the natives at large the study of the ancient language and literature of their country."

Resolved unanimously, that the Draft be approved and adopted, and the Memorial signed by the President, on the part of the Society, be transmitted without delay to the Honorable Court, through the local Government.

The Secretary reported the general opinion of the Committee of Papers, in favor of continuing the publication of the "Researches," in the quarto form, which was accordingly *Resolved*.

The report of the Committee of Papers, on the proposition of the Catholic Bishop of Isoropolis, was submitted, as well as a letter from Government, declining to patronize the publication of his Cochin-Chinese and Latin Dictionary.

Resolved, that the Bishop be made acquainted with the unfortunate result of the application to Government; and with the great regret of the Society, at having of itself no means to undertake such a work: with an offer also, should it meet his wishes, to transmit the manuscripts home to the Royal Asiatic Society, of which the Oriental Translation Committee may probably be induced to undertake the publication.

The Secretary submitted the determination and arrangements of the Committee of Papers, in regard to the Oriental Publications made over by Government.

[The substance of these will be found in the Prospectus published with the July No.]

Library.

The following Books were presented.

Notes of Lectures delivered at the College Hall of Madras, by G. Noton, Esq., Advocate Genl. of Madras, on the system of Government and administration of Justice in India—*by Cavelly Venkata Laxmiah, through Kumar Radhacant Deb.*

Col. Beaufoy's Hydraulic and Nautical Experiments—*by his Son, the publisher.*

The Indian Journal of Medical Sciences, No. 21, for September—*by the Editor.*

Meteorological Register, for July, 1835—*by the Surveyor General.*

Hutchinson's Report on the Medical Management of the Native Jails throughout the territories subject to the Governments of Fort William and Agra—*by the Author.*

Museum.

A letter from H. Blundell, Esq. Commissioner at Arracan, presented for the Society's museum, a cast metal *Drum*, as a specimen of the skill of the rude and barbarous tribes on the northern frontier of the Moulmein district, called the Red Kayrens. An extract from Dr. Richardson's MS. journal of his mission to the Shan countries was read in explanation.

[This Journal should have been published long since; but it has been accidentally mislaid—we refrain from publishing the extract, in hopes of obtaining another copy of the whole.]

A letter from M. Des Noyers, of the Mauritius, acknowledging his election as an Honorary Member, and presenting a stuffed "Devil," *(Dasyurus Ursus,)* from New South Wales.

A letter from Lieutenant NEWBOLD, announced the despatch for presentation of a series of Geological Specimens of the Malay Peninsula.

The following mounted specimens were presented by M. BOUCHE':

1. *Loxia Oryzivora*, (the Ploceus Oryzivora of CUVIER.)
2. *Merops Viridis.*
3. *Columba Tigrina.*
4. *Muscicapa (?) Saularis.*
5. *Bucco Cyanops.*
6. *Bucco.*
7. *Oriolus Melanocephalus.*
8. *Brachypus Jacosus.*
9. *Pavo Cristatus.*
10. *Anastomus Coromandelianus.*
11. *Canis Familiaris Extrarius.*

Also a nest of the *Loxia (Ploceus) Philippinus.*

A live specimen of the *Python Amethystina*, was presented by P. CHIENE, Esq. 34th Regt. N. I.

Literary and Antiquities.

Read a letter from W. H. WATHEN, Esq. dated Bombay, June 1835, enclosing fac-similes of two ancient grants on copper, dug up in Gujerat, with an analysis of the form of Nágarí in which they are engraved, a translation, and a memoir on the subject.

[This valuable paper will appear in our next.]

A letter from C. NORRIS, Esq. Chief Secretary to the Bombay Government, forwarded copy of a Report on some inscriptions found at Hummum, on the Southern Coast of Arabia, by Assistant Surgeon HULTON, and Mr. SMITH of the Palinurus, while that vessel was employed under command of Captain HAINES, in negociating with the Sultán of Kishen, for the purchase of the Island of Socotra, and subsequently on the survey of the South Coast of Arabia.

[This paper will have early attention.]

A letter from G. W. TRAILL, Esq., Commissioner of Kemaon, forwarded copies of several inscriptions in unknown characters (ancient Nágarí), at *Barahát* and *Gopeswar* in *Garhwál.*

A letter from M. RICHY, communicated a late discovery of a singular inscription on the passage leading to the theatre at Pompeii, of which an account has been lately published by M. DE CLARAC, Curator of Antiquities in the Louvre at Paris.

The inscription is as follows: AD XI K DECEMB. A XV, EPAFRA, ACVTUS, AVCTVS AD LOCVM DVXERVNT MVLIEREM TYCHEN ET PRETIVM IN SINGVLOS A. VIII M. MESSALA L. LENTVLO COS.

Without adverting to the shameless nature of the advertisement of the three freedmen, this inscription is deemed a curiosity from its containing a specific date (the only one found at Pompeii), and the name of two consuls, who had been the subject of controversy among antiquarians.

Casts of three gold coins of the Indo-Scythic King KADPHISES, were presented in the name of Colonel T. P. SMITH.

These highly curious coins were procured in the common bazar at Benáres, whither they were brought two years ago by a Marhatta pilgrim. The Greek inscription on all is most clear, BACIΛEVC OOKMO KAΔΦICHC, and the devices differ from all hitherto discovered. One of them represents the king in a Grecian war-chariot. We shall hasten to present our readers with an engraving of them.

The Secretary exhibited to the Members present, Colonel STACY's extensive collection of Indian coins, just arrived from the Upper Provinces.

The series of ancient Hindu coins filling one cabinet is highly interesting, and more complete perhaps than any hitherto collected. Of the Canouj groupe, one coin attracted particular notice from its bearing in most legible characters the name of SAMUDRA GUPTA, the sovereign mentioned on the Allahabad *Láth;* but no where else that has hitherto been discovered. We propose immediately to glean some of the riches from Colonel STACY's labours, in illustration of our Indian Numismatics.

To Seringapatam

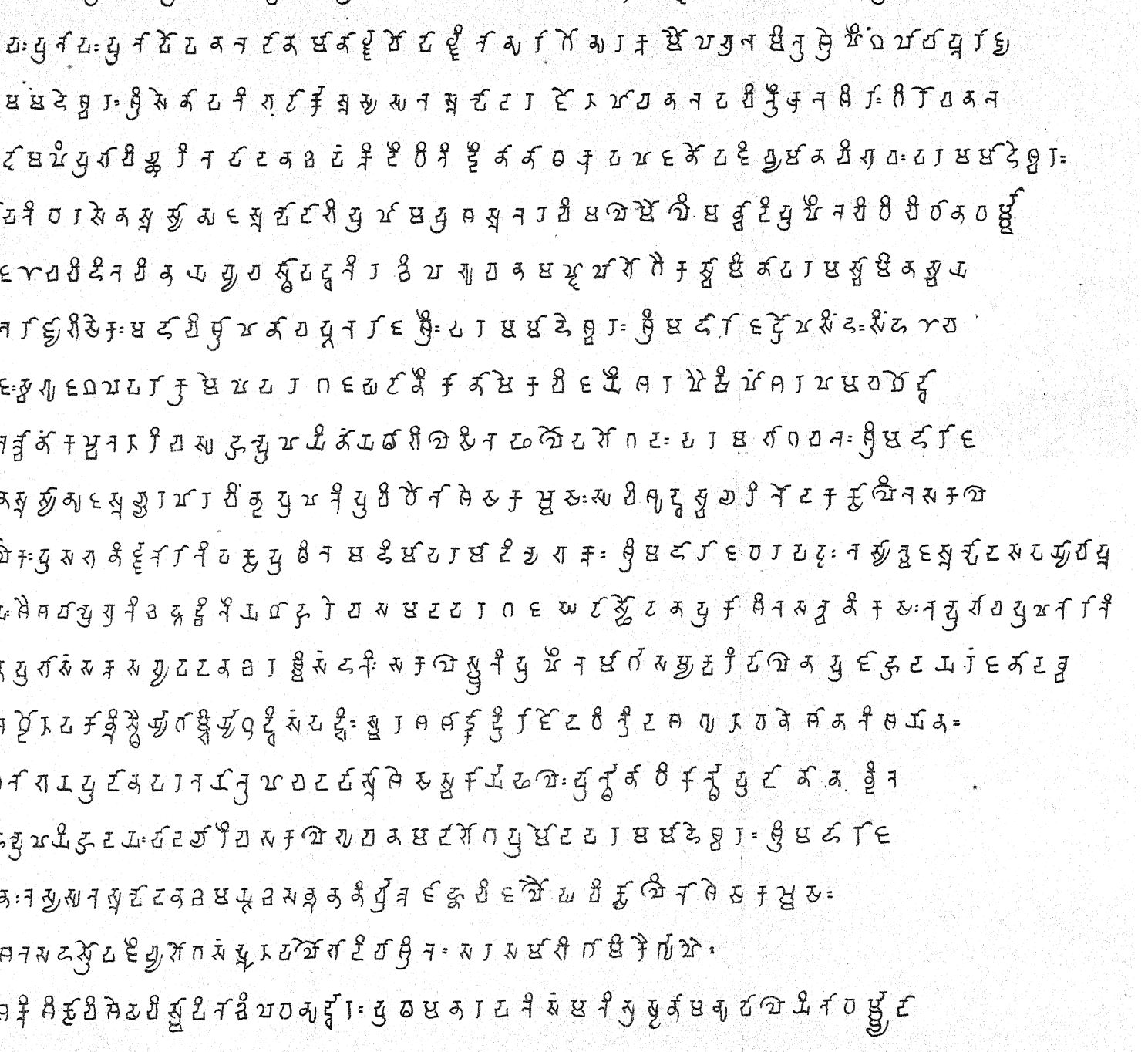
Meteorological Register, kept at the Assay Office, Calcutta, for the Month of August, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	29,579	28,472	1,107	83,9	3,5	3,3	93,	,478	,280	1,198	86,0	4,4	4,5	98,	77,0	91,1		W.	sse.	ses	fair.	fine.	theatening.
2	,605			82,5	4,6			,538			82,5	4,6			74,8	93,6	,85	o.	w. nw.	w.	rain.	dull.	rain.
3	,556	,474	1,082	83,2	3,8	3,5	93,	,488	,314	1,174	85,1	4,6	4,5	99,	76,3	91,8	,20	W.	se.	s.	cloudy.	overcast.	fine.
4	,628	,489	1,139	83,6	4,3	4,6	93,	,510	,286	1,224	86,4	5,1	5,6	93,	75,3	102,3		SW.	w.	S.	c. cirri.	fine.	do
5	,582	,406	1,176	85,3	3,5	3,7	97,	,497	,272	1,225	86,8	4,7	4,2	95,	79,3	105,0		w.	sw.	se.	do	do	hazy.
6	,569	,382	1,187	85,6	4,8	4,9	94,	,510	,322	1,184	87,0	6,0	5,7	94,	78,1	109,8		o.	sw.	sw.	do	do	hard rain.
7	,576	,380	1,196	86,2	2,9	3,0	97,	,466	,214	1,252	87,5	5,0	5,3	93,	77,8	110,2	1,25	o.	NE.	NE.	do	hazy.	showery.
8	,586			83,0	6,4			,487			84,5	5,9			77,4	95,2	1,00	W.	w.	W.	overcast.	cumuli.	fine.
9	,599			83,0	6,0			,523			83,5	2,7			75,7	89,1	1,00	o.	S.	S.	rain.	do	sett. rain.
10	,596	,422	1,174	85,4	4,4	3,5	96,	,519	,298	1,221	86,7	5,7	5,8	90,	76,2	92,6	,60	o.	sw.	sw.	cumuli.	do	fine.
11	,648	,461	1,187	85,9	4,4	4,2	94,	,541	,376	1,165	85,7	3,4	4,0	95,	76,4	100,0		se.	se.	N.	fine.	do	do
12	,664	,462	1,202	84,6	3,8	3,9	96,	,508	,322	1,186	85,6	3,9	4,1	95,	75,2	92,4		ne.	ne.	ne.	overcast.	do	showery.
13	,666	,460	1,206	84,7	3,0	3,1	97,	,522	,347	1,175	85,4	3,7	4,0	95,	75,7	89,2	,45	E.	se.	se.	cumuli.	do	fine.
14	,692	,498	1,194	84,6	4,4	3,7	96,	,606	,424	1,182	84,5	4,6	4,0	95,	74,8	91,4	,20	se.	se.	SE.	do	cloudy.	do
15	,674	,497	1,177	84,1	3,0	3,0	98,	,614	,421	1,193	84,5	3,1	3,0	97,	76,3	87,0	,10	se.	se.	S.	overcast.	cum. str.	showers.
16	,686			79,0	5,0			,606			80,8	5,0			74,8	86,4	,65	S.	S.	S.	nimbi.	fine.	fine.
17	,737			81,6	7,3			,653			82,0	3,6			75,5	86,0	,50	E.	E.	e.	cumuli.	do	rain.
18	,746	,548	1,198	84,2	3,0	3,0	93,	,620	,336	1,224	85,1	4,2	4,6	95,	75,2	96,5	,30	E.	se.	s.	do	drizzle.	fine.
19	,704	,492	1,212	84,6	4,3	4,7	94,	,569	,246	1,323	87,7	7,4	6,8	90,	76,5	102,4	,05	s.	se.	sw.	fine.	fine.	do
20	,602	,348	1,254	86,1	4,0	4,5	94,	,528	,208	1,320	88,1	6,2	6,2	91,	77,7	105,4		e.	se.	se.	do	do	do
21	,684	,410	1,274	87,0	4,5	5,0	93,	,560	,278	1,282	87,4	3,9	4,1	94,	78,2	107,8		E.	se.	ne.	do	cloudy.	do
22	,682	,420	1,262	86,9	4,4	4,5	94,	,590	,230	1,360	88,1	5,8	5,3	94,	79,1	105,3	,60	E.	e.	sw.	do	do	overcast.
23	,598			83,0	7,6			,468			87,0				76,1	105,4		ne.	e.	ne.	do	fine.	do
24	,596	,297	1,299	86,5	4,6	4,7	94,	,403	,220	1,271	86,3	3,7	3,7	96,	78,3	94,6		E.	NE.	ne.	do	nimbi.	do
25	,532	,376	1,156	84,5	3,4	3,0	97,	,492	,336	1,146	84,3	3,2	2,9	97,	77,3	89,1	,20	ne.	ne.	se.	do	drizzle.	rain.
26	,676	,582	1,094	82,9	2,9	2,8	98,	,590	,445	1,145	84,1	3,6	3,3	96,	74,2	88,2	1,70	E.	ne.	se.	rain.	sett. rain.	cloudy.
27	,706	,591	1,115	83,0	2,6	2,9	97,	,643	,516	1,127	82,6	3,1	2,6	98,	75,5	83,9		e.	ne.		sett. rain.	do	do
28	,676	,568	1,108	82,9	2,4	2,3	98,	,569	,493	1,066	82,7	2,2	2,3	98,	75,8	83,2	,25	sw.	sw.	SW.	cloudy.	cloudy.	storm.
29	,573	,497	1,076	82,0	2,0	2,0	99,	,490	,450	1,040	82,5	2,9	2,4	99,	75,7	90,0	,10	o.	sw.	o.	rain.	drizzle.	do
30	,478			80,7	3,0			,397			81,7	5,1			75,6	99,0	1,40	W.	W.	nw.	do	rain.	hard rain.
31	,429	,270	1,159	83,5	1,6	1,9	99,	,323	,166	1,157	84,1	3,6	3,4	96,	77,2	100,8	,20	nw.	nw.	nw.	cumuli.	gathering.	gale.
Mean,	29,591	28,450	1,176	84,0	4,0	3,6	96,	,529	,327	1,203	85,0	4,3	4,3	95,	76,4	95,3	11,60	South and east.			Seasonable weather.		

Instruments the same, and situated as usual.

Facsimile of the seal appended to the above ambient Inscription

Facsimile of Inscription in the ancient character



Alphabet of the antient character with the corresponding letters in Devanagari Simple consonants

क	क·	k	द	ड·	d	प	म·	m
ख	ख·	kh	ध	ढ·	dh	फ	य·	y
ग	ग·	g	न	ण·	n	ब	र·	r
घ	घ·	gh	न	त·	t	भ	ल·	l
ङ	ङ··	n	प	थ·	th	म	व·	v
च	च·	ch	फ	द·	d	य	श·	sh
छ	छ·	chh	ब	ध·	dh	र	ष·	sh
ज	ज·	j	भ	न·	n	ल	स·	s
झ	झ·	jh	म	प·	p	व	ह·	h
ञ	ञ·	ny	य	फ·	ph		ळ·	l
ट	ट·	t	र	ब·	b	श	क्ष·	ksh
ठ	ठ·	th	ल	भ·	bh	ष	ज्ञ·	

Vowels *Initials*

अ	आ	इ	ई	उ	ऊ	ऋ	ॠ
a	ā	i	ī	u	ū	ri	rī
		ऍ	ऍ	ॅ	ॅ	ऌ	ॡ=
ऌ lri	ॡ lrī	ए e	ऐ ai	ओ o	औ ou	अं an	अः ah

Medials and Finals

ा	ि	ी	ु	ू	ृ	ॄ	े	ै	ः	=
ा	ि	ी	ु	ू	ृ	ॄ	े	ै	ः	:

J.B. Tassin lith.

Compound Consonants

with and without vowels annexed

ष्टु	ष्टि	ष्ट्र	ष्ट्रे	यु	उ	क्त	र्दृ	न्त
श्री	श्री	स्व	स्वि	ष्प	त्र	त्त	ण्ड	क्क
री	ट्टृ	ग्र	र्ग्र	ध्व	ज्ञ	थ्रु	ड्ड	ट्ट्र
ध्व	र्ज्जे	भृ	ष्टा	ज्य	क्क	च्छु	व्य	श्च
र्ट्ट्र	ध्रुं	श्च	ट्ट	ट्ठे	र्रे	भ्रु	क्ष	ष्ट्र
न्वा	र्म्मा	स्थ	द्धी	द्दे	त्वो	त्स	ट्ट	ध्रु
ष्ट्र	ऋ	ष्ट्रि	श्च	ष्ट्रु	ष्ट्रु	ट्टि	ष्ट्र	ट्ट
त्म	क्ष	ण्य	स्फ	स्मृ	म्य	ब्द	य्य	ङ्ग
क्रु	ग्र	ग्र	ङ्क	ष्ट्र	ध्रू	ट्ठु	ड्ड	ष्ट्र
न्ह	स्त्र	प्लु	क्ष्म	ष्म	म्न	क्ट्र	घ	म्न
ट्ट्रि	ट्ठ	ऊ	ी	ष्ठ	ष्ट्र	ट्ठ	ट्ठ	ष्ट्र
ज्ञ	क	क्ष	ब्र	ह्म	स्क	ट्ट	थ्र	स्य
ट्ट	ग्र	ट्ट	ङ्क	ट्ठ	ष्ठ	ष्ट्र	ष्ट्र	ष्ट्र
त्स	स्त्र	त्व	ट्ट	त्स	च्च	त्स	श्म	स्म
ऊ	ब्र	त्र	ष्ट्र	ष्ट्र	ऋ	ट्ट	ऊ	ग्र
क्प	न्न	न्न	श्च	ध्य	स	त्म	ऊ	ष्ट
ट्ट्र	ट्ट्र	ष्ट्र	ट्ट	ष्ठ	ष्ट्र	ष्ट्र	ष्ठ	ष्ट्र
त्स	ष्प	ट्ट	ट्ट	ष्ठ	थ्व	च्छ्र	न्ध	ष्ट्र

To Srirangapatam

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 45.—September, 1835.

I.—*Account of the Inscriptions upon two sets of Copper Plates, found in the Western part of Gujerát. By* W. H. WATHEN, *Esq. Persian Secretary to the Bombay Government.*

[In a letter to the Secretary of the Asiatic Society.]

Several years since, I procured two sets of copper inscribed plates, one of which had been discovered by some laborers employed in digging the foundations of a house at *Danduca*, in the Peninsula of *Gujerát;* and the other in a similar manner, at *Bhavanagar*, in the same province: the inscriptions being, however, in a character unknown to the learned on this side of India, I found it impossible at that time to decypher them.

Encouraged, however, by the very interesting discoveries brought to public notice in your valuable Journal, as connected with the hitherto unknown character of the inscriptions on the Allahabad pillar, and the recent success of the Reverend Mr. STEVENSON, I again endeavoured to decypher the two inscriptions, in which I derived much assistance from the alphabet given in your number for March, 1834; and having observed a repetition of the same letters in many parts of the inscription, I concluded these were the titles preceding the names of the kings of the dynasty, to which the prince making the grant belonged.

In consequence, I found from your key the words *Rája* ( ), and looking for *Mahá*, I discovered that the ( ) of the inscription was *m*, instead of *sh*, which the alphabet given in the Journal would have made it. The title *Paraméswara* next struck me, and led to the discovery of *Parma Mahesvara*, and gave me a clue to the ( ) p, of the character used; I had previously made out *Svasti*, of the com-

mencement; but it was long before I could understand the vowel mark *i*, (ै) which I took for *anuswara*; after these, and a few other letters had been ascertained, the first of the inscriptions was easily decyphered, with the aid of a learned pandit.

The second was more defaced, and after the greatest trouble, a part of it still remained unintelligible, the letters having become obliterated by the effects of time and damp.

They are both grants of lands to priests; the first is about fifteen hundred years old; and the date of the second, some hundred years subsequent.

Thinking that an account of these inscriptions, and of the character in which they are written, may be interesting to some of your readers, and throw some additional light on the ancient history of the west of India, I have ventured to trouble you with the accompanying paper, for insertion in your Journal.

A translation of the inscription A is transmitted, and the substance of the other will be given in the accompanying observations. W. H. W.

The character in which these grants are written, is evidently derived from the more ancient one which is found in the caves of *Kaneri*, of *Carli*, and *Verula* (Ellora), on this side of India; it also resembles that of the cave inscription decyphered by Mr. WILKINS in the first volume of the Asiatic Researches.

With the view of facilitating the future researches of antiquarians, who may meet with the same description of writing, a comparative alphabet of this character and *devanágarí*, (No. 1.) and a fac-simile of one of the inscriptions, interlined with the modern *devanágarí*, (No 2.) are annexed*.

One original character, being that found in the caves, appears to have first existed throughout the western parts of India, that is in the *Dakhan*, *Konkan*, *Gujerát*, and perhaps more generally. It seems to have undergone gradual changes, until about two centuries subseqnent to the æras of VICRA'MADITYA and SALIVA'HANA, an alphabet nearly similar, or identical with that at present noticed, would appear to have been introduced. In order to shew that there is considerable ground for

* See Plates XL. and XLI. We have separated the modern Sanscrit interlineation, which permitted of being set up in type, giving figured references to the lines of the more ancient Nágari lithographed in Plate XL. We have also ventured to omit the 3rd and 4th pages of the lithographed Alphabet, containing the compound consonants with their several vowel marks, as these combinations will be obvious to those who know the letters, and have the necessary examples before them in the inscription itself.—ED.

such a supposition, copies of as many of the various cave characters, on this side of India, as could be easily procured, were collected and arranged in the order of what appeared to be their relative antiquity.

Selections from these, and also from grants of subsequent date to those which are here principally treated of, have been made to give an idea of the manner in which the ancient writing has gradually been changed to its present form: these are all taken from copper-plate and other inscriptions (which are deposited in the Museum of the Bombay branch of the Royal Asiatic Society). From one of these it appears, that up to *Saca* 730, or A. D. 808, no very material difference in the character had taken place. The accompanying lithographic plate (No. 3), contains specimens of varieties of writing from the most ancient times to the present*.

The hope of meeting with a key to the alphabet now decyphered, led to references to those of Tibet and other countries; and a strong similarity was remarked between it, the *Kawi* (*Kávya Bhásha*) character of Java, used in that country when under the government of its Hindu conquerors, the *Páli* of Siam, and the alphabet of Tibet; from each of these, a few lines have been copied, by reference to which, the close resemblance of many of the letters to those of the inscription (No. 2), will be apparent.

Several of the provincial alphabets also have been evidently taken from this source, long before the remodeling of the present *devanágarí*: a few of the most striking coincidences are also given in the same plate with the above (No. 4).

The resemblance of this character to those of Tibet, and the sacred alphabets of Siam and Java, may perhaps tend to throw some light upon the æra of the conquest of Java, Sumatra, and several of the eastern islands by the Hindus, and also on that of the introduction of the Buddhist religion into Tibet, and the countries eastward of the Brahmaputra.

The contents of these inscriptions, as tending to elucidate the ancient history of Western India, at the commencement of the fourth century of the Christian æra, are of some interest, as will be pre-

* We defer the publication of these comparative alphabets, because we think they may be rendered more complete by the addition of those to which we have access on this side of India. Such a palæographical table has been long a desideratum, and Mr. WATHEN's contribution will furnish a considerable portion of the list. Our recent inscriptions from Shekáwat, and Benares must, however, be added to complete it, and the various *Páli* offsets from the *Magadhí* require to be more fully developed.—ED.

sently detailed : a list of the princes enumerated will be found in the Appendix, (No. 5).

In the first inscription, as well as in the second, the origin of this dynasty is traced to BHATARCA SENÁPATI, who is said to have established his power by signal bravery and prowess : his capital named *Valabhipura**, is also expressly mentioned in the first grant ; both the founder of this sovereignty, and two first successors, did not take the title of king, but *Senápati*, or General, whence it may be inferred, that they were under a paramount sovereign, by whom the province of *Gujerát* was committed to their charge ; and it is stated in the description of the fourth prince of this family, that he was raised to the royal dignity by "the great monarch, the sole sovereign of the entire world," meaning India.

The third in succession to him, named SRIDHARA SENA, would appear to have thrown off all dependence on this paramount sovereign of *Ujayana* or *Kanouj* ; for by the date of the first inscription, the *Valabhi Samvat* or æra would appear to have been instituted in his reign, its date being *Samvat* nine : this circumstance induced the belief, at first, that the æra referred to was that of VICRAMÁDITYA, until on referring to the 1st volume of TOD's Rájasthan, the existence of a *Surya-vansa* dynasty in *Gujerát*, whose capital was *Valabhipura*, and title "*Bhatarca*," and also of a *Samvat*, or æra peculiar to those kings, as proved by Jaina legends, and inscriptions found at *Somnáth*, *Pattan*, &c. shewed that these grants must belong to those princes and their æra alone.

Colonel TOD established, from the materials already mentioned, the particulars of which may be seen on reference to his work†, the following historical data.

1. The emigration of a prince named KENEKSEN, of the *Surya-vansa*, or race of the sun, from *Koshala*‡ *dèsha*, and his establishing himself in *Gujerát* about A. D. 144.

2. The institution of an æra, called the *Valabhi Samvat*, by his successors, who became the independent kings of *Gujerát* : the first year of which æra was the 375th of VICRAMÁDITYA, or A. D. 319.

3. The invasion of the kingdom of the *Valabhi* princes by a barbarian force, the destruction of their capital *Valabhipura*, in A. D. 524, and the removal of thes eat of government to the north-eastern part of *Gujerát*, most probably at first to *Sidhapura*, about A. D. 554.

The inscriptions confirm, in a singular manner, these several epochs.

* In *Pracrit*, it is written with a *b*, "*Balabhi*."

† See the chapter entitled "Annals of Mewár." ‡ The present Oude.

The first inscription is dated 9th *Valabhi Samvat*, corresponding with 384 of VICRAMA'DITYA, and A. D. 328.

Now allowing twenty years for the average reign of the six princes of the first inscription, this will give 129 years for the interval between SRIDHARA SENA, in whose reign this æra may be supposed to have commenced, and BHATARCA SENÁPATI, the founder of the dynasty, which will place him as having lived in A. D. 190, or within forty-six years of the time specified by TOD, as that of KENEKS'EN's establishment in *Gujerát*. That *Bhatarca* was a family title, and not the real name of this chief, is shewn by its being alone used in the seals affixed to both the inscriptions.

From the second inscription, we have a long line of princes, the last of whom, SILÁDITYA MUSALLI, would appear, from an allusion therein, to have removed the capital to *Sidhapura*.

Taking the number of kings, whose names are given subsequent to SRIDHARA SENA, the founder of the *Valabhi* æra, at twelve, and the length of their reigns at an average of twenty years each; this calculation will shew a term of about 240, or more years, to have elapsed from this time, to that of SILÁDITYA MUSALLI of *Sidhapura*, or A. D. 559, about thirty-five years after the sack of *Valabhipura* by the barbarians.

On referring to the list of kings, another of the name of SILÁDITYA, it will be seen, just preceded the prince who made the grant contained in the 2nd inscription, whose reign will thus approximate to A. D. 524, stated in the *Jaina* legends to be the date when the capital was surprised by a foreign army. From the same source also, we find the name of the prince who then reigned, to have been SILÁDITYA, as above.

These coincidences are curious, and tend to confirm the authenticity of those fragments of early Hindu history, which TOD has so carefully collected.

The *Jaina* historical legends all mention the kings of this dynasty, and their æra, the *Valabhi Samvat*; the capital, from its geographical position, would appear to have been the Byzantium of PTOLEMY; its kings were of the dynasty called by foreigners the *Balhára*, which may have been a corruption of the title *Bhatarca**, or derived from the adjoining district of *Bhala*, and *Rai* or prince; the absurd manner in which Hindu names were, and still are, corrupted by the Arabs, and other foreigners, may easily account for the difficulty of reconciling real names with their corruptions.

* Bhatarca, literally means cherishing sun; it is a royal title.

It is a singular circumstance connected with the destruction of *Valabhipura*, that it would appear to have been conquered by a *Mhlechha*, or Bactro-Indian army, which, it may be presumed, came from a Bactrian kingdom then existing, in which were probably comprised the present *Múltán*, *Sindh*, *Cachha*, and perhaps many other provinces; whether this state became subsequently divided into several petty principalities, one of which held the southern part of *Sindh* and *Cachha*, is a query which remains to be solved; the southern part of *Sindh*, however, has been known from the most ancient times, by the appellation of *Lar*, which would be in Sanscrit *Larica*: now the kingdom of Larike is mentioned expressly by PTOLEMY, but is made to comprise the coast of *Gujerát*, which might have been conquered by it; the strongest fact in support of this theory is, that many Bactro-Indian* coins, with the head of the prince, evidently of inferior Greek workmanship, something similar to those found at the *Manikyála Tope*, &c. have been found in great numbers in *Cachha*, and in parts of *Saurásh*tra†.

It may be here mentioned, that it is from this very family of *Valabhipura*, that the legends of the present Ránas of *Udayapur* (Oodipoor) deduce their descent.

After reigning some years in the north of *Gujerát*, the power of the dynasty was destroyed, its kingdom dismembered, and the city of *Anhalwara Pattan* became the capital, under the succeeding dynasties of the *Chawura* and *Chalukia* (vulgo *Solanki*) races.

Both of these grants convey fields to brahmans as religious gifts. The lands granted in the second inscription are stated to be situated in *Saurásh*tra, and the donees are said to have come from *Girinagara*, (*Júnagur* or *Girnal*,) and to have settled at *Sidhapura*.

Two facts, proving the great antiquity of these grants, are,—first, the measure of land being square paces; and the other, the existence of the worship of the sun: one of the princes is named as being of that sect.

In the course of antiquarian researches in India, we cannot but remark the very opposite course pursued by the *Jainas*, and the *Brahmans*, in regard to the preservation of historical legends; the *Brahmans* are accused by the *Jainas* of having destroyed, wherever they

* These are probably the Greek coins ARRIAN mentions as current at *Barigaza* or Broach. [We shall, I trust, hear more of these coins from Col. POTTINGER or Capt. BURNES. It is essential to know to which of our new series they belong.—ED.]

† Saurásh*tra*, or the region of the worshippers of the sun, comprised the whole of the peninsula at present called Kathiawar.

gained the supremacy, all the historical books in existence, which related facts anterior to the Musalman conquest; and we certainly do not find in the *Dakhan*, and other countries which have been long under their exclusive influence, any thing whatever prior to that period; whereas, on the contrary, the *Jainas* have treasured up in their libraries, every historical legend and fragment that could be preserved by them.

May it not be inferred, that the brahmans, sensible of the great changes introduced by themselves to serve their own avaricious purposes, in the Hindu worship, at the æra of the Musalman conquest, neglected the preservation of the historical works which then existed; for as no king of their own faith remained, and their nobles and learned men must have lost their power and influence, no one was left who took any interest in their preservation; and it appears probable, that at such period, the *Puránas* were altered, and the novel practices now existing introduced, to enable these wily priests still to extort from the superstition of the people, what they had formerly enjoyed by the pious munificence of their own kings.

The *Jainas* indeed assert, that the *Puránas* are mere historical works; that PARASURÁMA, RÁMACHANDRA, KRISHNA, &c. were merely great kings, who reigned in *Oude* and other places, and have not the slightest pretensions to divinity.

It may tend to confirm this theory, when we consider, that all the great reformers of the Hindu religion, whose doctrines and whose expositions of that faith are now followed, flourished about the same period when India was thrown into confusion by the invasions of those ferocious and fanatical barbarians, the Arabs, the Turks*, and Afghans, or from five to eight hundred years back; SANKARA A'CHÁRYA, VALABHA A'CHÁRYA, and RAMANUJA A'CHÁRYA, are all supposed to have lived between those periods.

The great Hindu sovereignties falling to pieces, it became impossible to perform sacrifices requiring such prodigious expenditure†, the kings of foreign faith, no longer ruling by the Shástras, no check existed to the intermixture of castes: hence the Warna Sankara; the *Kshetriyas* overcame, and fleeing from their foes, emigrated into various parts, laid down the warlike profession, and engaged in civil and commercial pursuits: hence the present *Kshetri*, the *Prabhi*,

* By Turks, I mean natives of Central Asia.

† Such as *Asvamedha*, &c., notwithstanding the assertions of the brahmans that these sacrifices of the horse, &c. have been abolished in this *Kali-yuga*, we find instances of their performances recorded in inscriptions of 800 years and later date.

the *Bhatti*, &c. once warriors, now scribes and merchants; the brahmans then, to raise themselves, and degrade the other castes, invented the fable of the destruction of the whole *Kshetriya* tribe by PARASURÁMA—a thing in itself incredible; but which story enabled them to substitute the Puránas, for the Vedas, in conducting the sacred offices, as connected with those classes.

Further, if we inquire into the origin of many of the present most popular incarnations, as worshipped in western India, we shall no doubt trace them to the æra when the Puránas were interpolated and converted from mere historical legends into books of scripture. A new impetus was thus given to superstition, by the discovery of these supposed miraculous emanations of SIVA, VISHNU, and GANESA, in the shape of *Khundeh Rao**, *Wittoba*, and the *Chinchwara Ganapati*.

That great changes were introduced about the period of the Musalman invasion, into the practices of the Hindu religion, and that many as they now exist, are far different to what they were previous to that æra, are facts which will become better known and ascertained, as the antient history of the country becomes more cleared from the obscurity in which it is at present involved.

Translate of an ancient Inscription, dated 9th of the Valabhi Samvat, or A. D. 328, and found in digging the foundations of a house, near Danduca, in the Peninsula of Gujerát, or Saurâshtra.

May prosperity (ever emanate) from the city of *Valabhi!* The possessor of incomparable strength from the crowds of powerful enemies and friends, who prostrate themselves (before him), who earned glory in hundreds of battles fought in the countries of his foes; whose prowess and renown dazzled (the eyes of the princes of the universe), one enjoying the affections (of his subjects) by grants of rewards and honors, and also by courteous behaviour. The acquirer of royal prosperity by the strength (aid) of his numerous dependents and attached friends, great adorer of *Mahesvara* (SIVA), (such was) Senápati BHATARCA (BHATARCA, the general-in-chief).

His son, with head tinged of a reddish colour, by constant inclination to the dust of his father's feet, and thus rendered pure: the lustre of the nails of whose feet (as mirrors) surpassed the diamonds of SUCRA's diadem, whose riches were a constant source of relief to the poor, helpless, and destitute, (was the) great worshipper of *Mahèsvara*, Srí Senápati DHÁRA SENA (the general of the forces, DHÁRA SENA).

His younger brother with forehead wholly sanctified by prostrations at his (brother's) feet, a performer of all the acts of devotion accord-

* These are all peculiar to the *Mahratta* country, their temples being at *Jejury*, *Pundarpur*, and *Chinchwar*.

ing to the precepts of MENU, and other holy saints, who, like DHARMA Rája (YUDHISTHIRA), has arranged all laws, received his inauguration to the throne, "from the Great Sovereign* himself, the sole monarch of the entire world," and whose accession to royalty was solemnized by unbounded gifts. He was the great worshipper of *Mahesvara*, Srí Mahárája DRONA SINHA (the fortunate king, DRONA SINHA.)

His younger brother, who by the prowess and force of his sole arm, as a lion, conquered the hosts of his enemies, mounted on elephants, the asylum of all those who sought a place of refuge, conversant with all the various principles of science,—a celestial, all-yielding tree to friends and dependants, affording to all enjoyments according to their several wishes and tastes; great follower of BHAGAVATA (VISHNU) (was) Srí Mahárája DHARUVA SENA.

His younger brother, all whose sins were removed by prostrations before the lotus-resembling feet of his (elder) brother, by whose virtuous conduct, as a pure stream, the crimes of the *Kali-yuga* were washed away; whose fame was celebrated by crowds of vanquished enemies, was the great adorer of the sun, Srí Mahárája DHARAPATTAH.

Whose son acquired the chief of virtues by adoration of his father's feet; whose sword from his infancy was his sole helper; who distinguished himself as the touch-stone of bravery; the destroyer of multitudes of foes resembling intoxicated elephants. The bright lustre of the nails of whose feet were reflected by the splendour of the crowds of his prostrate enemies; who fulfilled the import of the title "Rája," by delighting the hearts of his subjects, and affording them protection, (and by governing,) as commended in the *Smritis* (holy books); who surpassed SVARA (Cupid) in beauty, the moon in splendour, the monarch of mountains (*Himálaya*), in fixedness of purpose. In depth (of thought and counsel) the ocean, the teacher of the gods in wisdom, the great master of riches (CUVERA) in wealth; who relinquished as straw, the fruits of his enterprises, in his anxiety to remove the fears of those who sought protection; delighter of the hearts of the learned of friends and dependants, by bestowing riches far beyond their desires; who enjoyed all the gratifications and luxuries of the various countries in the world, as one who had himself travelled through them, (was) the great worshipper of *Mahesvara*, Srí Mahárája GRIHA SENA.

His son, for ever fortunate by the rays proceeding from the diamond-like nails of his father's feet;—all whose sins are washed away by the pure water of the *Ganga* (Ganges); whose wealth and prosperity are participated in by multitudes of friends and dependants:—in whom all the qualities of beauty, have taken up their abode, as if by the desire of associating with the beauties of his form; who has astonished all those skilled in archery, by his wonderful natural skill, improved as it is by superior and constant exercises; the maintainer of all pious grants, bestowed by the will of ancient kings: he that removes from power, those (evil ministers) who seek the ruin of his subjects:—a unique example of the abode of wisdom and

* This evidently refers to some one of the successors of VICRAMA'DITYA and SHA'LIVA'HANA. The *Pramara* or *Powar* kings of Ujain or Canouj.

prosperity, in one and the same person, whose renown is alone sufficient to destroy the power of his foes, whose royal dignity is heriditary;—great worshipper of *Mahesvara*, powerful wielder of the battle-axe, Srí Mahárája SRIDHARA SENA,—peremptorily issues these his mandates!

To those in office, and those unemployed; to the governors of towns; to the chiefs of districts, revenue officers, forest chiefs, protectors of the roads, &c. &c. and all officers howsoever employed!

'BE it known to you! that for the increase of my father's and mother's holiness, for my own salvation, and for the sake of obtaining other objects of my heart's desire, in this and in the next world, I have granted fifty paces of land, (situated) at the southern boundary of the village of *Matsira*, and sixty paces of land near the northern limit of *Veraputri*, to a *Lodrita* brahman, learned in the *Rig-Veda* of the same *gotra* (family), as KAINA and others: also a piece of land of fifty paces, on the western side of *Prathapura*, and eight paces near *Ishvara Deva Senak* is likewise granted to a *Rig-Veda* brahman, named DEVA SILA of the same *gotra*, as TRIVALAM BAYANA, &c. (this part is very unintelligible in the original,) this land, with the hamlets and other things thereunto pertaining, with its earth, water, wind, sky, spirits, grain, and gold, is (hereby) given, with all that which may thereupon be produced.

'All the ministers of state must avoid placing their hands on this, as they would on the hole of a serpent; for the constant and due performance of the five great sacrifices (naming them), I have given this; for as long as the moon, sun, seas, rivers, and this world shall exist, to be enjoyed by the descendants, sons, grandsons, &c. By pouring out water, (it is) given up as a brahmanical gift; to be enjoyed on the terms usual with such grants; they may plough, cause to be ploughed, or give it away. No one should cause any hindrance (to this grant).

'Future pious kings, both of our family, and others, who will appreciate the fruits of a grant of land, should approve and maintain this my gift. (Here the usual quotations from the *Mahá Bhárata* are introduced, quoting the gift by king SAGARA, and shewing the sin of destroying such a grant of land).

'Written by the minister for peace and war, SCANNA BHATTA, *Samvat* 9, Vaisháca vadi 8. I, Mahárája SRI'DHARA SENA, the heroic, my pleasure! my hand!'

List of kings of the Valabhi or Balhára dynasty, as found in the two inscriptions.

A. D. 144 or 190	1.	Senápati BHATARCA.
	2.	DHARA SENA.
	3.	Mahárája DRONA SINHA.
	4.	DHRUVA SENA, I.
	5.	DHARAPATTAH.
	6.	GRIHA SENA.

To Sringapatam

Transcript of the Inscription in the modern Devanagari character.

1 खस्तिवल्लभीतः प्रसभप्रणतामित्रचाणां मैत्रकाणामतुलबलसपत्नमण्डलाभोगसंसक्त [illegible] संप्रहारलब्धल
2 व्यप्रतापः प्रतापः प्रतापोपनतदानमानार्জ্জवोपार्জ্জितानुरागानुरक्तसौम्यश [illegible] तमित्रश्रेणीवलावाप्तराज्य
3 श्रीः परममाहेश्वरः श्रीसेनापतिभटार्कस्तस्यसुतस्तत्पादरजोरुणावनतपवित्रोह [illegible] तशिराः शिरोवनत
4 शक्रचूडामणिप्रभाविच्छुरितपादनखपंक्तिर्दीधितिर्दीनानाथकृपणजनोपजी [illegible] व्यमानविभवः परममाहेश्वरः
5 श्रीसेनापतिधरसेनस्तस्यानुज्जस्तत्पादाभिप्रणामप्रश्रस्तरविमण्डलमौलिमन्वादिप्र [illegible] णीतविधिविधानधर्म्मा
6 धर्म्मराज इव विहितविनयव्यवस्थापद्धतिरखिलभवनमण्डलाभोगैकखामिन [illegible] परमखामिनास्तय
7 सुपस्थितराज्याभिषेको महाविश्राणनावधूतराजश्रीः परममाहेश्वरः श्रीमहारा [illegible] जक्षोणसिंहः सिंहइव
8 तस्यानुजः खभुजबलपराक्रमेण परगजघटानीकानामेकविजयी शरणैषिणां [illegible] शरणमवबोद्धा
9 शास्त्रार्थेनलानां कल्पतरुरिव सुहृत्प्रणयिनां यथाभिलषितफलोपभोगदः पर [illegible] रमभागवतः श्रीमहाराज
10 ध्रुवसेनखस्यानुजखचरणारविंदप्रणतिप्रविधौताशेषकल्मषः सुविशुद्धखचरित [illegible] दत्तोत्तिसकल
11 कलिकलंकः प्रसभनिर्জিतारातिपक्षप्रथितमहिमा परमादित्यभक्तः श्रीमहारा [illegible] जधरभट्टः तस्यात्मजस्तत्पादसपर्यावाप्त
12 पुण्योदयः शैशवात्प्रभृतिखद्वितीयबाहुरेव समदपरगजघटास्फोटनप्रकाशि [illegible] तसलनिकषः तत्प्रभावप्रणतारति
13 चूडारत्नप्रभासंसक्तसव्यपदनखरश्मिसंहतिः सकलस्मृतिप्रणीतमार्गसम्यक्परि [illegible] पालनप्रजाहृदयरंजनाद्रञ्ज
14 थैराजशब्दोरूपकान्तिस्थैर्य्यगाम्भीर्य्यबुद्धिसंपद्भिः स्मरशशाङ्कादिराजोदधिचिद [illegible] णगुरुधनैश्चानतिशयानः
15 शरणागतभयप्रदानपरतयात्मवद्वपाख्याशेषखकार्यफलः प्रार्थनाधिकार्थप्रद [illegible] नानन्दित
16 विद्वत्सुहृत्प्रणयिहृदयः पादचारीव सकलभुवनमदाभोगप्रमोदपरममाहेश्वरः [illegible] श्रीमहाराज
17 गुहसेनखस्यसुतस्तत्पादनखमयूखसन्ततनिर्धौतजान्हवीजलौघविच्छालिताशेषक [illegible] ल्मषः
18 प्रणयिशतसहस्रोपजीव्यभोगसंपत् रूपलोभादिवाश्रितःसरसमाभिगामिकैर्गुणैः
19 सहजशक्तिश्चिविशेषविस्मापिताखिलधनुर्द्धरः प्रथमनरपतिसंमतिरुष्टानां [illegible] नुपालयिता धर्म्मदा
20 यानामपाकर्त्ता प्रजोपघातकारिणामुपप्लवानां दर्शयिता श्रीसरस्वत्योरेकाधिवासः संश्रतारति
21 पक्षलक्ष्मीपरिक्षोभदक्षविक्रमः क्रमोपसंप्राप्तविमलपार्थिवश्रीः परममाहेश्वरोम [illegible] हाराजश्रीधरसेनसुश्लो
22 सर्व्वानेवायुक्तकविनियुक्तकट्टांगीकमहत्तरचाटभटशौल्किकचाटभटादीनन्यां [illegible] श्च यथासंबन्धमानका
23 न्समाज्ञापयत्यस्तु वः संविदितं मया मातापित्रोः पुण्याप्यायनायात्मनश्चैहिकामुष्मिकयथाभिलषितफलावाप्तये भटसर
24 सि दक्षिणशीम्नि पादावर्त्तीपंचाशत्तथावीरपुत्रे उत्तरसीम्नि पादावर्त्तीषष्टिवक्कृच्चक्करादिसगोत्रब्राह्मणच्चद्रखखेदंष्ट्य
25 पुत्रईश्वरदेवसेनके अपरसीम्नि पादावर्त्तीपञ्चाशत्वक्कृचतथाचैवालंबायनसगोत्रदसिखाय पादावर्त्तीत्र्यशीतिवत
26 सोद्रङ्गसोपरिकरसवातभूतधान्यहिरण्यादि देयं सोत्पद्यमानविष्टिकं समस्तराजकीयानामहसप्रत्ये
27 पणीयं भूमिच्छिद्रन्यायेनैषामेव च बलिचरुवैश्वदेवाग्निहोत्रातिथिपंचमहायज्ञिकानां क्रियाणां समुत्प
28 र्य्यणार्थमाचन्द्रार्कार्णवसरित्तिस्थितिसमकालीनं पुत्रपौत्रान्वयभोग्यं उदकसर्म्मणाक्षुद्देयं निसृष्टं
29 यतोसोचितया ब्रह्मदेयस्थित्याभुंजतां क्षपतंकर्षयतां प्रदिशतां वा नकेनचित्प्रतिषेधेवर्त्तितव्यमा
30 गामिभद्रन्पतिभिस्सामान्यंभूयोभूयोयाचितकमवेहि भगवतीमप्येतर्हि कमलासनः परमेश्वरः सकलमिदमुदाहरति
31 व्यमस्मद्वंशेनुमंतव्यः परिपालयितव्यश्च यश्चैनमाच्छिंद्यादाच्छिद्यमानं वानुमोदेन सपं
32 चभिर्महापातकैः सोपपातकैःसंयुक्तःस्यादित्युक्तं च भगवता वेदव्यासेन व्यासेन । षष्टिवर्षसह
33 स्राणि स्वर्गे तिष्ठति भूमिदः । तच्छेत्ता चानुमंता च तान्येव नरके वसेत् ।। पूर्व्वदत्तां द्विजातिभ्योयत्ना
34 द्रक्ष युधिष्ठिर । महीं महीमतां श्रेष्ठ दानाच्छ्रेयोनुपालनम् ।। बहुभिर्वसुधाभुक्ता राजभिःसगरादिभिः
35 यस्यस्यद्यद्याभूमिस्तस्यतद्यतदाफलमिति ।। लिखितंसन्धिविग्रहाधिकृतस्कन्दभटेन ।। संवत् १ ।।
36 स्वहस्तोमम महाराजश्रीधरसेनस्यदूतिवीरः । वैशाखवर्णना

On the Seal, under the bull, श्री भटार्कः

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List

A. D.

A. D. 300	7.*	SRI'DHARA SENA, I.†
	8.	SILADITYA, I.
	9.	CHARAGRIHA, I.
	10.	SRI'DHARA SENA, II.
	11.	DHRUVA SENA, II.
	12.	SRÍDHARA SENA, II.
	13.	SILADITYA, II.

At this part of the copper-plate the writing is so obliterated, that the names of two or three princes cannot be made out.

	16.	Mahárája CHARAGRIHA, II.
A. D. 524	17.	SILADITYA, III.
A. D. 559	18.	SILADITYA MUSALLI, IV.

The first two princes have the title *Senápati* alone. All those subsequent to No. 3, *Mahárája*. The whole had the title of "SRI' BHATARCA," and the device on their banner, was the "NANDI," or sacred bull of SIVA, as appears from the seals attached to both inscriptions.

II.—*Synopsis of the Thár and Ghorál Antelopes.* *By* B. H. HODGSON, *Esq., Resident in Nipal.*

[In a letter to the Secretary As. Soc. read 7th Oct.]

I beg to forward to you, herewith, synoptical descriptions of the Thár and Ghorál Antelopes, derived from careful examination of a great many individuals of both sexes, which were either alive or recently killed at the time of examination. These descriptions are preceded by an amended definition of the group to which the animals belong; that given by SMITH in the English Regne Animal being so inaccurate, as to be calculated only to lead the inquirer astray. Mine, now proposed, is drawn from an intimate knowledge of three out of the four species comprising the group. But it is probable that very much yet remains to be done before the vast genus Antilope can be successfully divided into subgenera, fitted either to illustrate natural affinities, or even to render perfect, facility of reference. Mr. OWEN has, since the publication of the English CUVIER, recast this entensive genus in a manner very different from SMITH's, though not, I think, superior to it. Considering, indeed, how extremely superficial is our knowledge of the greater part of this vast assemblage of the hollow-horned

* These seven are from the first inscription, the following from the second inscription.

† A. D. 319. In his reign, the Valabhi æra is supposed to have commenced.

ruminants, it might be as well, perhaps, for our general classifiers, to bear in mind the Baconian adage, that " an over-early reduction of knowledge into methods generates acquiescence" in misleading systems of nature.

My apology for the amended indication of the subgenus NÆMORHEDUS of the English Regne Animal, now attempted, is, that the celebrity of that work might fix and propagate errors which I happen to possess the means of correcting; and that, as I have an unusually complete knowledge of three out of the four species comprised in this group, my definition of it may perhaps stand the test of time, if the group itself be allowed to remain.

Nipal, August 1835.

English Regne Animal Synopsis.

Sub-Genus XIII. Nœmorhedus, SMITH.

Subgeneric character (nobis).

Structure assuming a caprine form, suited for heavy climbing, or for leaping; horns in both sexes, their cores hollow*, and connected with the frontal sinuses, but not porous, and only sub-cellular, inserted behind the orbits, short, conical, simply bent back, annulo-wrinkled, parallel to the plane of the face, and nearly so to each other, subremote at base; suborbital sinus, small, or wanting; no inguinal pores; tail caprine; ears longish, pointed, and striated; muzzle small, or none; knees callous? maned, hair of two sorts, and thick; or, of one sort, and spare; four teats in the females. Reside in the mountainous and woody regions of the continent and islands of India, solitarily, or in small groups.

Sp. 1. A. SUMATRENSIS. *Cambing Ootan.*

Sp. 2. A. DUVAUCELLII. Variety of *Ghorál!*

Sp. 3. A. GUORAL. Characters—extremely caprine, being allied to antelope only by its round and ringed horns. Size small, attitude gathered, with back much arched, and structure adapted for leaping; limbs moderately stout and rigid; general form of the scull caprine, with the ridge line much bent, and the parietes depressed at a strong angle to the frontal bones, and no indentation before the orbits; fifty inches long, exclusive of the tail, and twenty-seven high; horns seated on the crest of the frontals, six inches long, the points inclined inwards, 20 to 25 annuli extending $\frac{2}{3}$rds up the

* This, as a generic character, has been used to separate Capra and Damalis from Antelope; upon which I have only to observe, that I know four species still retained under Antelope, which have nevertheless hollow-cored horns.

horns; annuli crowded and vague, especially towards the bases, somewhat interrupted by faint longitudinal striæ, truncated, independant of each other, and equally developed all round; no suborbital sinuses, a half muzzle; upper lip clad, tail conico-depressed, and only half nude below; fur of two sorts, abundant and loosely applied to the skin; a short, semi-erect mane on the vertex. Knees usually callous and nude, but not congenitally so; colours of the animal rusty and brown, paler below; line of the vertex, tail, chest, and a stripe down the front of the fore legs and back of the hind, brown black; outsides of ears rusty, lips and chin rufescent white, a large patch of pure white at the junction of the head and neck, below; horns, hoofs, and muzzle, black; iris, dark hazel; eye, mean. Inhabits juxta Himálayan region of Nipal. Female smaller and paler hued; young, redder and no marks or mane.

Sp. 4. A. THA'R, nobis. The *Thár* of the Nipalese. New. Characters less decidedly caprine than in the last, very nearly allied to the *Cambing Ootan*. Back straight, withers higher than the croup, and structure suited for heavy climbing, not for leaping; limbs very stout and rigid, with higher hoofs than in the last, the edges of which are raised above the pads. General form of the scull cervine, with the ridge line *moderately* convexed, and the parietes *not* depressed at a strong angle to the frontal bones. A deep indentation before the orbits. Horns posterior to orbits, but below the crest of frontals, eight inches long, rather stouter and less falcated, than in the preceding, sub-divergent, with the points inclined outwards, 20 to 30 crowded annuli, extending $\frac{2}{3}$rds up the horns, the annuli truncated, equal all round, independant, broken by decided longitudinal striæ; one inch below the eye, a suborbital sinus, opening on a nude space by a round puncture, and furnished with a fleshy thick gland secreting a viscous humour, as in Sumatrensis; no maxillary sinus, a half muzzle; larger than in the preceding, but existing only as a broad line in front of the upper lip, which is otherwise clad in hair. Tail shorter, depressed nude below; fur of one sort only, scanty, harsh, and applied to the skin; a semi-erect-mane, as in *Ghorál*; knees, callous, perhaps congenitally so. Sternum not so, size large, 64 inches long by 38 high, and upwards of 200 lbs. in weight. Colour of the whole animal above, with the entire head and neck, jet black; on the flanks, mixed with deep clay red. The fore arms and hams outside, as far down as the great flexures, clay red, nearly or wholly unmixed; rest of the limbs, hoary, or rufescent hoary; outsides of ears, dark; chest, pale. No stripes down legs; lips and chin dull hoary, and a stripe of pure hoary running

backwards over the jaws from the gape; horns, hoofs, and muzzle, black; iris, dark hazel; eye, mean.

Female as large as male, and like him in all essential respects. The young, paler, and mixed with gray.

Inhabit the precipitous and wooded mountains of the central region of Nipal, which they rush up and down with fearful rapidity, though they do not spring or leap well, nor are speedy.

The *Thár* species are denominated *Sarau*, in the western parts of these mountains, where it is as common as in Nipal. The *Cambing Ootan* is its analogue in the Indian *Islands;* but the species is not found, I believe, in any other mountainous range of the continent of India.

III.—*On the Wild Goat and Wild Sheep of the Himálaya, with Remarks on the genera Capra and Ovis. By* B. H. HODGSON, *Esq. Resident in Nipal.*

In the way of classification, there are few objects, I believe, more important than the establishment of some distinctive marks to separate *Antilope, Capra* and *Ovis*. The best naturalists of the present day appear to think that M. GEOFFROY's diagnosis of the former genus, viz. cores of the horns solid, may be relied on. But small as is the number of Antelopes accessible to me, I have proved with the saw, that in respect to at least four species, (viz. *Chírá, Thár, Goral,* and *Duvaucellii,*) the fact is not so, all these four having sinuses in the cores of their horns, connected with the frontal sinuses: and, if it be objected, that of three of these the character is confessedly osculant towards *Capra*, that cannot be urged against the fourth, which is a *Gazella* of H. SMITH's group.

It is certain, therefore, that solid horns constitute not an *invariable* character of the genus Antilope; and it is highly probable, that this character is *not* of *such general prevalence* as to warrant the distinction founded upon it.

The truth seems to be this, that in *Antilope*, the bony nuts of the horns are of a compact structure, possessing at their bases sinuses of only limited extent, and nearly free from cellular partitions; whereas in *Capra*, and yet more in *Ovis*, the cores are porous and uncompact, and furnished at their bases with large sinuses, crowded with cells*.

On the present occasion, I do not propose to make any further mention of the genus *Antilope*, but to confine myself to some remarks

* The form of the scull a long vertical line, forms a much better diagnosis than the cores of horns.

tending to illustrate the distinctions between *Capra* and *Ovis*, and more particularly, to test the accuracy of those indications which are generally admitted by authors, by applying them to the wild species of either genus which belongs to the Himálaya.

For the last two years, I have had alive in my garden, a splendid specimen of the mature male of each, and I have frequently compared them together in all respects of manners and of structure. As the goat in question, as well as the sheep is new*, I will begin with a synoptical description of the two, and then proceed to notice the points of difference and agreement existing between them.

Tribe CAPRIDÆ—H. SMITH.

Genus—*Capra*, Ditto.

Species—C. JHÁRAL. New, the JHARAL of the Nipalese.

Affined to the Alpine *Œgagri*, and to *Jemlaïca*. Adult male, 50 to 56 inches long from snout to rump, and 36 to 40 high. Head finely formed, and full of beauty and expression. Clad in close short hair, and without the least vestige of a beard; facial line, straight; ears small, narrow, erect, rounded at tips, and striated; eye, lively; between the nares, a black moist skin, nares themselves short and wide; knees and sternum, callous; tail, short, depressed, wholly nude below. Animal of compact, powerful make, with a sparish, short, and bowed neck, deep barrel and chest, and longish, very strong and rigid limbs, supported on perpendicular pasterns and high compact hoofs; false hoofs conic and considerably developed; attitude of rest gathered and firm, with the head moderately raised, and the back sub-arched. Shoulders decidedly higher than the croup; fore quarters superb, and wholly invested in a long, flowing, straight, lion-like mane, somewhat feathered vertically from the crown of the withers, and sweeping down below the knees; hind-quarters poor and porcine, much sloped off from the croup to the tail, and the skin much constricted between the hams behind; fur of two sorts—the outer hair of moderate harshness, nor wiry nor brittle, straight, and applied to the skin, but erigible under excitement, and of unequal lengths and colours; the inner, soft and woolly, as abundant as in the wild sheep, and finer, of one length and colour. Horns 9 to 12 inches long, inserted obliquely on the crest of the frontals, and touching at base with their anterior edges, sub-compressed, sub-triangular, and uniformly wrinkled across, except near the tips, where they are rounded and smooth; keeled and sharpened to the front, obtusely rounded behind: the

* My own imperfect account of both, in the Society's Transactions, is the only one extant.

edge of the keel not nodose, and usually but faintly marked by the continuation over it of the transverse wrinkles of the horns.

The horns are divergent, and directed more upwards than backwards: their points are slightly inclined inwards. The colour of the animal is a saturate brown superficially, but internally, hoary blue; and the mane, for the most part, *wholly* of that hue; fore arms, lower part of hams, and backs of the legs, rusty; entire fronts of the limbs, and whole face and cheeks, black-brown; the dark colour on the two last parts divided by a longitudinal line of pale rufous, and another before the eye, shorter; lips and chin hoary, with a blackish patch on either side below the gape; tip of tail and of ears, blackish; tongue and palate, and nude skin of tips and muzzle, black; iris, darkish red hazel. Odour very powerful in the mature male, especially at certain times. Is found in the wild state in the Kachár region of Nipal, in small flocks or solitarily; is bold, capricious, wanton, eminently scansorial, pugnacious, and easily tamed, and acclimatised in foreign parts.

REMARKS. *Jhâral* is closely affined by the character of the horns to the Alpine *Œgagri*, and still more nearly, in other respects, to *Jemlaïca*. It differs from the former by the less volume of the horns, by their smoother anterior edge, and by the absence of the beard;—from the latter, by horns much less compressed and nodose. *Jharal* breeds with the domestic Goat, and perhaps more nearly resembles the ordinary model of the tame races than any wild species yet discovered. The western type of the Himálayan wild goat (called *Tehr*, at Simla and Musúri) has the anterior edge of the horns decidedly nodose, though less so than in *C. Jemlaïca*.

The Wild Sheep. Genus—*Ovis*.

Species—*O. Náhoor*, mihi.

The *Náhoor* of the Nipalese. New? variety of *O. Musmon?* Closely affined to *Musmon*, of which it is possibly only a variety. Adult male, 48 to 54 inches from snout to rump, and 32 to 36 high. Head coarse and expressionless, clad entirely in close short hair, without beard on the chin or throat, or any semblance of mane. Chaffron considerably arched. Ears medial, narrow, erect, pointed, striated. Eye dull, moist space between the nares, evanescent; nares narrow and long. Knees and sternum callous; tail medial, cylindrico-depressed, only $\frac{1}{2}$ nude below. Structure moderately compact, not remarkable for power. Neck sparish, bowed, with a considerable dip from the crown of the shoulders. Limbs longish, firm, but slender, not remarkable for rigidity, and supported on laxer pasterns, and on hoofs lower and less compact than

the goats ; false hoofs mere callosities. Attitude of rest less gathered and firm, with the head lower and the back straight. Shoulders decidedly lower than croup ; fore-quarters not more massive than the hind, nor their extremities stronger. Hair of two sorts—the outer hair, of a harsh, brittle, quill-like character, serpentined internally with the salient bows of one hair fitting into the resilient bends of another, but externally, straight and porrect from the skin, very abundant, and of medial uniform length all over the body : the inner coat, soft and woolly, rather spare, and not more abundant than in the Goat. Horns, 22 inches along the curve, inserted high above the orbits, on the crown of the forehead, touching nearly at base with their whole depth, and carrying the frontal bones very high up between them ; the parietals being depressed in an equal degree. The horns diverge greatly, but can scarcely be said to be *spirally* turned. They are first directed upwards, considerably before the facial line, and then sweep downwards with a bold curve : the points again being recurved upwards and inwards. They are uncompressed, triangular, broadly convexed to the front, and cultrated to the back. Their anterior face is the widest, and is presented almost directly forwards ; their lateral faces, which are rectilinear, have an oblique aspect, and unite in an acutish angle at the back. They are transversely wrinkled, except near the tips, which are round and smooth. Colour pale.

The colour of the animal is a pale slaty blue, obscured with earthy brown, in summer overlaid with a rufous tint. Head below, and insides of the limbs and hams, yellowish white. Edge of the buttocks behind and of the tail, pure white ; face and fronts of the entire limbs and chest, blackish ; bands on the flanks, the same, and also tip of the tail. Tongue and palate dark. Nude skin of lips and nose black. Eye yellow-hazel. No odour. Is found in the wild state in the Kachár region of Nipal, north of the Jhára1, amid the glaciers of the Himálaya, and both on the Indian and Tibetan sides of the snowy crest of that range. Is sufficiently bold and scandent, but far less pugnacious, capricious, and curious, than the *Jhára1.* Much less easily acclimatised in foreign parts than he is ; in confinement more resigned and apathetic, and has none of the *Jhára1's* propensity to bark trees with his horns, and to feed upon that bark and upon young shoots and aromatic herbs. I have tried in vain to make the *Náhoor* breed with tame sheep, because he will not copulate with them. The female of the species has the chaffron straight, and short, erect, sub-recurved, and greatly depressed horns. The young want, at first, the marks on the limbs and flanks, and their nose is straight.

REMARKS. Differs from *Musmon*, to which it is closely allied, by the decided double flexure of the horns; their presence in the females, and the want of a tuft beneath the throat. With reference to the imperfect account of the *Náhoor*, published in the Transactions, I should not omit to say, in conclusion, that the *Náhoor* and *Banbhèra* are separate species, the former being the Himálayan type of *Musmon perhaps:* and the latter, certainly, that of *Ammon*.

Having now completed the descriptions of the wild goat and wild sheep, I shall proceed to the exhibition of the points of difference and of resemblance existing between the two, beginning with the former.

GOAT.	SHEEP.
Whole structure stronger and more compact.	Less so.
Limbs thicker and more rigid.	Feebler and more slender.
Hoofs higher and more compact.	Lower, and less so.
False hoofs well developed.	Evanescent.
Head smaller and finer.	Larger and heavier.
Facial line straight.	Chaffron arched.
Ears shorter and rounded.	Longer and pointed.
Tail short, flat, nude below.	Larger, less depressed and ½ nude only.
Withers higher than croup.	Croup higher.
Fore legs stronger than hind.	Fore and hind equal.
Croup sloped off.	Not so.
Odorous.	Not so.
Nose moister, and nares short and wide.	Less moist, and nares larger and narrower.
Horns of medial size, keeled and turned upwards.	Horns very large, not keeled and turned to the sides.
Eye darker and keener.	Paler and duller.
Hair long and unequal.	Short and equal.
Back arched.	Back straight.
Bears change of climate well.	Bears it ill.
Is eminently curious, capricious, and confident.	Is incurious, staid, and timid.
Barks trees with its horns, feeding on the peel and on aromatic herbs.	Does not bark trees, and is less addicted to aromatics.
In fighting, rears itself on its hind legs, and lets the weight of its body fall on the adversary.	In fighting, runs a tilt, adding hither the force of impulse to that of weight.

The goat and sheep have in common hair and wool; no beard; no suborbital sinuses; evanescent muzzle; no inguinal pores. Horns in contact at top of head; knees and sternum callous; angular and transversely wrinkled horns; striated ears; two teats only in the females: horns in both sexes, and incisors of precisely the same forms.

Of the various diagnostics, then, proposed by HAMILTON SMITH, it would seem, that the following only can be perfectly relied on to separate *Ovis* from *Capra*. Slender limbs; longer pointed ears; chaffron

arched; nares long and oblique; very voluminous horns turned laterally with double flexures. I should add myself, the strong and invariable distinction;—males not odorous, as opposed to the males odorous of the genus *Capra*. But, after all, there are no physical distinctions at all equivalent to the moral ones, so finely and truly delineated by BUFFON, and which, notwithstanding what H. SMITH urges in favour of the courage and activity of sheep, will for ever continue to be recognised as the only essential diagnostics of the two genera.

III.—*On the Fossil Bones of the Jamna River. By* EDMUND DEAN, *Serjeant, Sappers and Miners.*

[Extract from a letter, dated 2nd April, 1834, accompanying the first despatch of specimens, read at the Meeting of the 3rd July, 1834.]

I have taken the liberty of sending for your inspection some specimens from a collection of Jamna fossils, made by me during a period of nearly two years, that I was employed under Captain E. SMITH, in removing the impediments to navigation in that river.

I consider myself fortunate in having been able to procure several portions of human bones, in so perfect a state, as to enable an eminent medical gentleman to class the major part of them.

With regard to the specimens before you, No. 8, (an elephant's tooth,) resembles the 2nd and 3rd plates represented in plate x. fig. 10 of PARKINSON's Outlines of Oryctology; and No. 9, the 1st and 2nd plates of the same tooth, excepting that the number of the elliptic figures on the crown caused by trituration, is greater in my specimens; and that great difference in the thickness of the plates of this and the common Asiatic elephant, (a specimen of which I observe is in your possession,) which he appears to consider a distinguishing characteristic of the different species, is not so apparent in my specimens as it appears to have been in those of PARKINSON. This difference, however, must be confined to the Asiatic specimens, as the length of his fossil tooth was eight inches, and it was composed of 13 plates, which would make two of them average 1·23 in.: this, allowing for the very apparent diminution in thickness of the plates towards the rear, would make my larger specimen, which averages one inch, correspond nearly enough with the plates 2nd and 3rd of fig. 10.

Nos. 10 and 11, (figs. 1 and 2, of Pl. xxxiii.) I have been led to suppose may have belonged to the species of tapir, the crowns of whose teeth are described as being divided into five transverse risings, and if by the enamel standing distinctly above the bony parts, the

term rising be understood, I consider this feature is pretty clearly indicated in the larger specimen; if they do not belong to this animal, I am utterly at a loss how to class them.

Nos. 14 and 15, I imagine, are portions of the jaws and teeth (broken off at the margins of their alveoli) of some extinct species of the Saurian order, differing in every material point from any species described by PARKINSON; the transverse section of either shewing no cutting ridges, and the longitudinal section of No. 15, plainly shewing from their curved formation, the impossibility of the teeth being shed, or renewed, as also the existence of a core without any cavity; whereas a peculiar feature of the whole crocodile tribe is, the teeth are never solid in the centre. Could the larger one have belonged to that scarce monster, the Bhote of the Jamna? a species of crocodile, I believe, that has never yet been described.

Of No. 19, it will be of little use for me to take more notice, than by pointing out what appears to me to have been the outline of the crown of a circular cavity, in the centre of the tooth, which might, when perfect, have contained the nerve. Should this prove to be the case, at least one-third of the tooth must have been broken off, and then the present surface would have been a fracture. The exterior edges all round evidently present a decided fracture; but the interior surface (so beautifully irregular) has every appearance of the exterior enamel of a perfect tooth. Supposing it to have been arranged in plates (of which however there is not the least trace), the decomposition of the crusta petrosa might have occurred here, as in the elephant; but the separation (except by force) would have been rendered impossible, by the texture of the enamel that surrounds it on three sides, which is sufficiently strong, even had the crusta petrosa been withdrawn, to have held it together. It might be urged, that the exterior substance is not enamel, but an incrustation; this indeed might hide the disposition of plates; but I am inclined to believe, that the qualities of the whole and fractured parts are so intimate, that the position is untenable.

The teeth marked 0-2, 4, 6, and 16, have belonged to animals of the deer and ox tribes, but I have not the means of accurately classing them by comparison or otherwise.

No. 44, (fig. 18, Pl. xxxiii.) has defied the anatomical abilities of every one who has hitherto seen it. I have been able to form no opinion on it; never to my recollection having seen any vertebra in the least resembling it.

Specimens of Human Bones, sent Aug. 1834*.

No. 1. Supposed to be the remains of the humerus, consisting of the major part of the round head that plays in the cup of the scapula. It was dug out from under a mass of clay at a depth of about 2 ft. 6 inches.

No. 2. May either be a portion of the fibula, or of the ulna, of a child, or woman: this I imagine may easily be decided by any anatomist. It must be of considerable antiquity, as the tube originally occupied by the marrow is completely filled with a hollow concretion or spar, externally solid, and taking the exact mould or form of the concave or inner figure of the walls of the bone. In the interior hollow of this concretion a great number of very fine and sharp-pointed crystals occur, with their points or vertices apparently pointing inwards to a common elongated centre or axis; from which it would appear that the system of this concretion was either by the increase of the crystals in size, or by their gradual projection from the exterior inwards in a radiated manner, to fill up the cavity. This specimen was found, and I have no doubt was petrified, amongst sand and shingle.

No. 3. Portion of the above, supposed to have belonged to a full-grown man.

No. 5. One of the metacarpal bones.

Nos. 46 and 47. Assimilate nearly with the 2nd and 12th dorsal vertebræ; but have belonged to different subjects. (?)

No. 15. Appears to be a molar nearly perfect, and the remains of another broken in its alveolus, with a portion of the jaw covering each, and to have belonged to some of the larger species of deer.

No. 17. Posterior extremity of a rib of a young camel, having the same peculiar concretion as No. 34. (See postscript.)

No. 22. A portion of the jaw of a camel, containing one of the grinders.

No. 34. The remains of the blade bone of the shoulder of a young camel, remarkable for the peculiar cement or concretion filling its cancelli, originally the depositaries of marrow.

No. 18, (fig. 4.) Portion of the jaw of a pig, containing four grinders.

No. 26. Extremity of one of the ribs, and No. 23, portion of the plastrom or breastplate of the Cuchwa, or mud tortoise of the Jamna.

No. 62. Portion of a rib of a buffalo, procured at a greater depth

* We have thought proper to insert this notice, in continuation of the preceding, as the specimens referred to are deposited in the Museum, and have been imagined by more than one person to be human. See the following note.

(about six feet) *under* the clay than any specimen in the collection. It was not procured *in* the clay, but imbedded in a layer of sand, which the clay had enclosed in its deposit.

[The remainder of Serjeant DEAN's collection was presented early in the following year, reaching its destination in May last. The following is his description of its contents :]

17 pieces, No. 1. Teeth and fragments of bones of camels.

27——, No. 2. Ditto and ditto of ditto of bullocks and buffaloes.

11——, No. 3. Portions of bones of elephants.

10——, No. 4. Ditto of teeth of ditto and piece of tusk of hippopotamus, (now recognized to be such.)

5 pieces, No. 5. Portion of tufa formation, occupying the place of the marrow in the tusk of an elephant. These pieces are all that remain of a very large tusk taken out of the river at *Adhâe*, from beneath a plate of *kankar :* the bony part of the tusk was fossilized, but not petrified, and from its appearance, the sepoys engaged in the work during the absence of the European non-commissioned officer, broke it up to try the experiment of its making pipe-clay or whiting for their belts, and on burning it, succeeded beyond their expectations. It is now too late to regret this great loss, but I imagine it must have been a great curiosity, as it is described to have been at least eight inches in diameter.

4 pieces, No. 6, (fig. 16.) Portions of what I am told is the sting of the sting-ray petrified ; also a perfect sting (fresh) ; and the jaw of a water rat, (fig. 15.)

29 pieces, No. 7. Teeth of deer of various species.

9 ——, No. 8. Portions of antlers of ditto and other remains of ditto.

16 pieces, No. 9. Pieces of human bones.

5 ——, No. 10. Broken jaws of alligators.

5 ——. No. 11. Teeth of garial.

21 ——, No. 12. Portions of the shell, &c. of the *kachwa*, or mud tortoise.

3 pieces, No. 13. Pieces of teeth of hippopotamus.

2 ——, No. 14. Portion of jaw and teeth of goat or deer.

16 ——, No. 15. Petrified wood.

5 ——, No. 16. Specimens of pipe kankar.

2 ——, No. 17. Petrified perfect fish and shells.

I consider this fossil fish to be the greatest curiosity ever found in the Jamna. (See note.)

3 pieces, No. 18. Ribs, unknown.

[On the receipt of the first batch of specimens, a correspondence ensued, to ascertain the precise position of the fossils, and their true geological age; the opinions then upheld by their collector have been since more fully developed in his intelligent memoir published in the Journal for May. It will be as well, however, to insert here an extract from Mr. DEAN's previous letter of the 16th August, 1834.]

In answer to your question, whether any specimens (fossil) have been found under the kankar strata of the general Duab alluvium? Without any hesitation, I answer, not one instance has occurred.

It may be questioned, how in the deep bunds of the Jamna, excavated for the purpose of removing the clay banks or shoals, which are so dangerous to the navigation: trees, pieces of boats, and some very few instances of bones have been discovered, at depths of from 2 to 10 feet from the upper surface of the clay, from which perhaps a crust of kankar, from one to four feet thick, has first been removed, in a perfect state of petrifaction. This circumstance, on a superficial examination, might be deemed conclusive of these specimens having been actually removed from a level lower than the kankar strata of the general Duáb alluvium, and from under what would appear to be two regular and natural strata; and that there was every probability of their occurring at the same level under neighbouring and other strata, having no connexion with the river; but, Sir, I feel quite satisfied, that at two feet in or under any natural stratum of kankar placed at any level reached by the Jamna, no specimen of animal or vegetable deposit will be found; but I shall be enabled to prove in my observations on the obstructions of the river, that both these apparently natural strata of clay and kankar, are merely deposits, and which being removed, only leave the river, at this place, at a depth it has before attained; but which, from circumstances I believe peculiar to the Jamna, and which I shall hereafter treat on, may, from the rapidity (comparative) of their formation, give an appearance of the work of ages, to deposits, which have been the work of not more than 10 or 12 years.

I am aware, Sir, that I view this subject in a different light from that in which it has hitherto appeared to you. I feel convinced, however, that the researches of Indian geologists would be amply rewarded in examining the bed of the Jamna; but I should consider the discovery of fossil remains at a level corresponding with the deepest parts of the river in the sandy soil of the Duáb as the merest possible accident; and I shall be best understood when I say my firm conviction is, that such specimens of fossil animal or vegetable remains, as

are to be met with in the Jamna, owe their existence to some peculiar quality of the water alone; and I do not consider the fossils of the Jamna as at all connected with the natural kankar formation, although at any depth that the artificial or deposit kankar formation is found, they may reasonably be looked for.

IV.—*Note on the preceding. By* JAMES PRINSEP, *Secretary, &c.*

More than a year has elapsed since Mr. DEAN presented us with a first selection from the fossil bones he had discovered while engaged in blasting the rocks and impediments to navigation in the Jamna, under Major IRVINE, and afterwards Captain SMITH, of the Engineers: a few months prior to that, in November, 1833, we had been made acquainted with the fact of their occurrence by Captain SMITH, to whose valuable sketches on the stratification of the Duáb alluvium and notes on the position of the fossils, published in the Journal for December, 1833, I ventured to add a few remarks, suggesting the probability of their being subjacent to the kankar, and therefore of an age anterior to the deposition of the great bed of alluvium of the Sub-Himálayan plains, when all this part of the present continent was still buried under the expanse of waters.

This opinion has been combated by Serjeant DEAN in the preceding note, as well as in his memoir on the Duáb strata, printed in page 273 of the present volume.

The evidence of an eye-witness must be deemed sufficient, and the theory of original deposit with the alluvium must be given up. Still the hypothesis advanced in its stead by Mr. DEAN, of the fossilizing powers of the Jamna, and the probability of all the present specimens having been mineralized in sitû, does not appear adequate to meet the difficulties of the case.

It is so far true, that the bones are found in various stages of transformation; some in a crumbling state, the interstices filled with the sand and kankar conglomerate of the river; some lined, in the cells of the bones, with calcareous spar, and chalky earth; while others are, as it may be termed, wholly fossilized, of a dark shining brown colour, ponderous, brittle, of a conchoidal fracture, and retaining little even of the bone-earth itself in their composition. The substance into which the bones are thus converted, is a hydrated oxide of iron. The animal matter of the bone is probably first replaced by it, and then the softer portions. The hard enamel of the teeth resists decomposition for a long time, and its whiteness, contrasting with the dark brown of the cavities and encasing jaw

gives these fossils the exact appearance of half picked, dried or roasted bones. A fragment of the polished *osseolite* (for it deserves a mineral appellation) yielded on rough analysis,

Phosphate and carbonate of lime, ...	17·5
Water, ...	6·0
Red oxide of iron (with alumina ?),.....	76·5
	100

the specific gravity being 4·5.

Were the fossil ingredient every where carbonate of lime, some support might be gained for the theory of the modern conversion of the bones; but while no cause can be assigned for the ferruginous impregnation, nor less for the siliceous, (of which if instances are less frequent here, they are amply supplied from the analogous fossils of Jabalpur;) we shall be justified in seeking and assigning an extraneous origin for the organic remains of the Jamna. Indeed the very specimens upon which the greatest reliance might be urged by the advocates of local formation, those in which the bone is seen entirely imbedded in the hard kankar, furnish adverse evidence; for the fragments imbedded are broken and rounded, and their substance or composition is entirely heterogeneous to the matrix itself.

When to these arguments is added the strong fact of some of the fossil animals being such as could not have existed in the dry soil of Upper India, the point is in my opinion decided. Mr. DEAN mentions several imbedded specimens, and one whole animal, (the elephant at *Panchkourie**) as situated too high in the bank to be reached by the highest modern floods of the river; to these, therefore, he concedes the greatest antiquity, while of another he allows that the parts must have been washed into the situation in which they now lie, imbedded in the tufaceous conglomerate. Of the modern growth of this calcareous tufa there can be no question. The incrustations of roots and twigs (forming the pipe kankar of the specimens), and even of fragments of boats or sunken weapons, lost in wrecks on these dangerous shoals, are convincing proofs of it; but there is an essential difference between this formation and the true kankar of the banks.

There are two animals in Mr. DEAN's list, the camel and the human subject, which have kept up a suspense of judgment as to the nature of his fossil series, from their never having been discovered elsewhere: this difficulty is now removed by the sight of the specimens. Dr. PEARSON, and Dr. EVANS, are decided, that none of the fragments

* See the description and note in page 271—3.

described as human are such. Two of these are represented in the accompanying plate as figs. 20 and 21. The former, supposed to be the head of a human femur, is more likely to be the core of the horn of some large deer; the other is far too uncertain to be identified. The teeth and remains of the camel have been subsequently disavowed by the discoverer himself (see page 278), and are found to be all of the bovine genus.

We may then conclude, that the fossils now found in the bed of the Jamna, entangled among the rocky shoals, have been washed thither from some locality in which they were originally imbedded and fossilized. From Mr. DEAN's account, it is probable, that they were enclosed in the present bank, and have fallen in on its being cut away by the gradual action of the river. Should this however not prove to be the case, and search for their home be inquiringly extended to a distance; it is not necessary, as I had at first suggested, to travel back all the way to the ample store-house of fossils in the Sewálik range of the Lower Himálaya, whence such fragile materials could hardly be supposed to arrive with any vestige of form; for Lieut. VICARY has presented us with a nearer locality in the banks of the Betwá river*, and Mr. BENSON, from personal knowledge, confirms the probability of this spot having been the source of the deposit in the rocks of the Jamna. I myself incline to believe that both places have their fossils, and that many more may still be found here and there where natural sections of the alluvium have been formed by rivers, although to expect to fall upon them in the digging of wells would be as chimerical (to use a homely proverb) as searching for a needle in a bundle of hay.

There is in every respect a complete analogy between the fossils of the Jamna and those fortuitously discovered by CRAWFURD under the banks of the Irawadi in Ava. Their preservation is equally owing to their impregnation and conversion into hydrate of iron. The words of Professor BUCKLAND would probably apply as well to the one as to the other:

"At the bottom of the cliff, the strand was dry, and on it were found specimens of petrified wood and bones, that had probably fallen from the cliff in the course of its decay: but no bones were discovered in the cliff itself by Mr. CRAWFURD and Dr. WALLICH: nor were they more fortunate in several places where they dug in search of bones in the adjacent district. This district is composed of sand hills that are very sterile, and is intersected by deep ravines: among the sand are beds of gravel, often cemented to a breccia by iron or carbonate of lime; and scattered over its surface, at distant and irregular intervals, were found many fragments of bone and mineralized wood; in some instances lying entirely loose

* See Proceedings of the Asiatic Society, 1st April, 1835, page 183.

upon the sand, in others half buried in it, with their upper portions projecting naked, and exposed to the air. They appeared to have been left in this condition, in consequence of the matrix of sand and gravel that once covered them, undergoing daily removal by the agency of winds and rains; and they would speedily have fallen to pieces under this exposure to atmospheric action, had they not been protected by the mineralization they have undergone. On examining many of the ravines that intersect this part of the country, and which were at this time dry, the same silicified wood was found projecting from the sand banks, and *ready to drop into the streams;* from the bottom of which, the travellers took many fragments, that had so fallen during the gradual wearing of the bank, and lay rolled and exposed to friction by the passing waters. These circumstances shew that the ordinary effect of existing rains and torrents is only to expose and lay bare these organic remains, and wash them out from the matrix to which some other and more powerful agency must have introduced them."

I must now briefly advert to the specimens which I have selected to form the subjects of the annexed plate.—The space is far too limited to embrace Mr. DEAN's collection, much less the extensive additions received from Capt. E. SMITH, at Allahabad, since I engraved my former plate (Vol. II. pl. 25), of Jamna fossils. I have therefore prudently confined myself to *distinguishing specimens*, particularly teeth, which, besides their value as the best types of the animal, are, from their compact size, and hard quality, generally better preserved than ordinary bones.

The teeth, with Dr. PEARSON's assistance I have been able to identify; whereas without a complete Osteological Museum of existing animals (a desideratum we may hope, under his exertions, ere long to possess,)—it would be hazardous and a loss of time to attempt to classify the generality of mere mutilated fragments of bones. The great advantage of such a museum over even the best executed plates, was made most obvious in the course of the present examination: such of the teeth, as could be placed by the side of the actual teeth of Mr. PEARSON's private cabinet, were at once referred to their correct position in the jaw of the animal to which they belonged.

The drawings of all the specimens in the Plate are of half the true lineal dimensions.

Omitting the fragments of elephants' teeth, (Nos. 8 and 9,) as being much the same as those already familiar to us from former plates, I have commenced with the most important and curious of the present series, figs. 1 and 2. The former, which was supposed by Mr. DEAN to belong to the genus Tapir, proved to be the last molar but one on the right side upper jaw of the *fossil hippopotamus*, agreeing precisely with the drawing in pl. i. vol. I. fig. 3, of CUVIER's *ossemens fossiles*. This beautiful specimen is, to use the illustrious author's words, "précisement dans l'état de détrition on elle est le plus

facilement reconnoissable par les *trèfles* et les autres linéemens de sa couronne."

No. 2, is a young end tooth of the same animal, of which the points have not yet been submitted to the grinding action.

I cannot forbear inserting here an extract from the Baron's observations on the habitat of the existing hippopotamus, restricted to the central regions of Africa, from the earliest period of antiquity ;—and always a stranger to the continent of India.

"Outre le Cap et le Sénégal, on sait par BARBOT at par beaucoup d'autres voyageurs qu'il y en a quantité en Guinée et au Congo. BRUCE assure qu'ils sont très nombreux dans le Nil d'Abyssinie, et dans le lac Izana. Le VAILLANT en a vue dans toutes les parties de la Cafrerie qu'il a parcourues ; ainsi l'Afrique méridionale en est peuplée presque partout. Mais n'y en a-t-il que dans cette partie du monde ? C'est une ancienne opinion. STRABON, (lib. xv, p. 1012, A., ed. Amsterd. 1707,) sur le témoignage de NEARQUE et d'E'RATOSTHENES, nie déja qu'il y en ait dans l'Indus, quoiqu'il avoue qu' ONESICRITE l'eut affirmé. PAUSANIAS est d'accord avec eux ; et bien que PHILOSTRATE et NONNUS aient adopté l'opinion d'ONESICRITE, il est de fait qu'aucun voyageur accrédité n'a rapporté qu'on en trouve sur le continent de l'Inde, même au delá du Gange. BUFFON n'a été nullement touché du temoignage de MICHEL BOYN, qui en place à la Chine ; c'est donc à peu près sans autorité que LINNÆUS, dans ses éditions x. et xii. suppose qu'il y en a aux embouchures des fleuves de l'Asie ; ainsi M. FAUJAS paraissait bien autorisé à ne point admettre sur ce continent l'existence de l' hippopotame ; mais peut être n'aurait il dû étendre sa négation à l'Asie entière : car M. MARSDEN, auteur de considération, place l'hippopotame au nombre des animaux de l'île de Sumatra.

"Cependant il reste à savoir si M. MARSDEN lui même n'a pas été trompé." —*Oss. Foss.* i. 279.

The animal, MARSDEN alluded to, was most probably the tapir, for Messrs. DIARD and DUVAUCEL could find no trace of the hippopotamus either in Java or Sumatra.

Fig. 3, is the third molar right upper jaw of a very large ox, or buffalo, though the latter name, a stranger to fossil geology, should rather wait further confirmation*. The specimen corresponds precisely with the similar tooth of the largest buffalo in the museum.

Fig. 4, I at first took for the *little fossil hippopotamus* of CUVIER, vol. I. p. 334; but on placing it side by side with the upper jaw of a large hog shewn me by Dr. PEARSON, in the Society's museum, it

* I have just received a note from Lieut. BAKER, correcting, on this head, my notice of the animals in his and Lt. DURAND'S *Dadupur Museum*, in the Proceedings of the Asiatic Society, for July last, (page 409.) The buffalo, he says, has not yet been found in the *Sewálik* hills, although the ox is very common there. I possess a note and sketch, however, from Serjeant DAWE of a supposed buffalo's head, which is now on its way to our museum.

agreed with the latter in every particular, save that it was one-fifth larger.

Fig. 5, is the hindmost molar of the ox, a smaller animal than the last.

Figs. 6 and 8, are too views of the hindmost molar of one of the deer family. It corresponds precisely with a large antelope in the museum, and the Cuvierian characteristics of the teeth of the camel, antelope, goat, and sheep, which contradistinguish them from the other ruminants, namely, "qu'ils ont la face externe de leurs molaires inférieures simplement divisée en autant de piliers demi-cylindriques qu'elles ont chacune de doubles croissans," are particularly marked in it. The antelope is one of the animals not hitherto known in a fossil state, therefore it will be improper to pronounce upon a single tooth; but the goat and sheep are equally so, and the specimen is too large for them, and too small for the camel.

Fig. 7, seems to be the interior spire of the tooth of a ruminant, of which the exterior has been destroyed.

Fig 9, is the second milch tooth, in germ, of the ox or deer; and fig. 10, one of the middle incisors of the latter animal.

Fig. 11, is the second or third molar tooth of the lower jaw of a horse. It somewhat exceeds in size the corresponding tooth of the celebrated racing mare Eclipse, of 15 hands high, whose skull is in Dr. PEARSON's possession.

Fig. 12, is a fragment of the jaw of a small deer; the teeth are all lost, but one, which is ground down by age, until all the marks are effaced.

Fig. 13, is an incisor of some small ruminant.

Fig. 14, is rightly attributed by Mr. DEAN to the water rat. The delineations on the crown differ slightly from the drawings in CUVIER's synoptical plate of the "Rongeurs;" but they agree with the existing species.

Fig. 15, are Saurian teeth, probably of the *garial* or L. Gangetica. Several fragments of the jaw of the alligator appear in the collection, and many of the vertebræ of a dark-brown shining aspect, well preserved. One of these is represented in fig. 21, (upside down,) to shew the appearance of the processes.

Fig. 16, is correctly described by Mr. DEAN as the fossil sting of a ray fish, coinciding precisely with the recent specimen sent by him for comparison (of which a portion is delineated under the fossil, fig. 17).

Fig. 18. Several pointed calcareous spiracles, without organic structure, but semi-crystallized, appear to resemble the pseudostalactites thus described in Professor BUCKLAND's memoir on the Ava fossils :—

"There are other calcareous concretions that contain no kind of organic nucleus, but are composed of precisely the same materials as those which are found around the bones, and present many of the irregular shapes of the tuberous roots of vegetables; some of them also have the elongated *conical form of slender stalactites*, or clustered icicles—a form not unfrequently produced in beds of loose calcareous sand, by the constant descent of water along the same small cavity or crevice, to which a root or worm hole may have given the first beginning:" p. 383. Mr. DEAN'S collection has many examples of encrusted twigs and roots.

Fig. 19, the specimen which so much puzzled the gentlemen who examined the collection while in Mr. D.'s possession is in fact one of the most curious of the whole, nor is yet certain to what animal it should be assigned. Mr. PEARSON, on seeing it, pointed out its great resemblance to the cervical vertebra of the young camelopardalis, which died in Calcutta, a few years since, and of which he preserved the skeleton. Lieut. BAKER has favored me with a drawing of a similar bone, which he states to belong to a fossil elk in Serjeant DAWE'S collection. (See Pl. XLIV. and the description in page 507.) There are others of much larger dimensions, he says, in the Dadupur museum, the contents of which will form the subject of a plate in the ensuing number of the Journal.

The specimen set down as a small petrified fish, which it much resembles in outward form, is, on making a longitudinal section, found to be formed of oval concentric concretions, similar to those of the country almond; possibly they are the convolutions of some shell, but certainly not a fish.

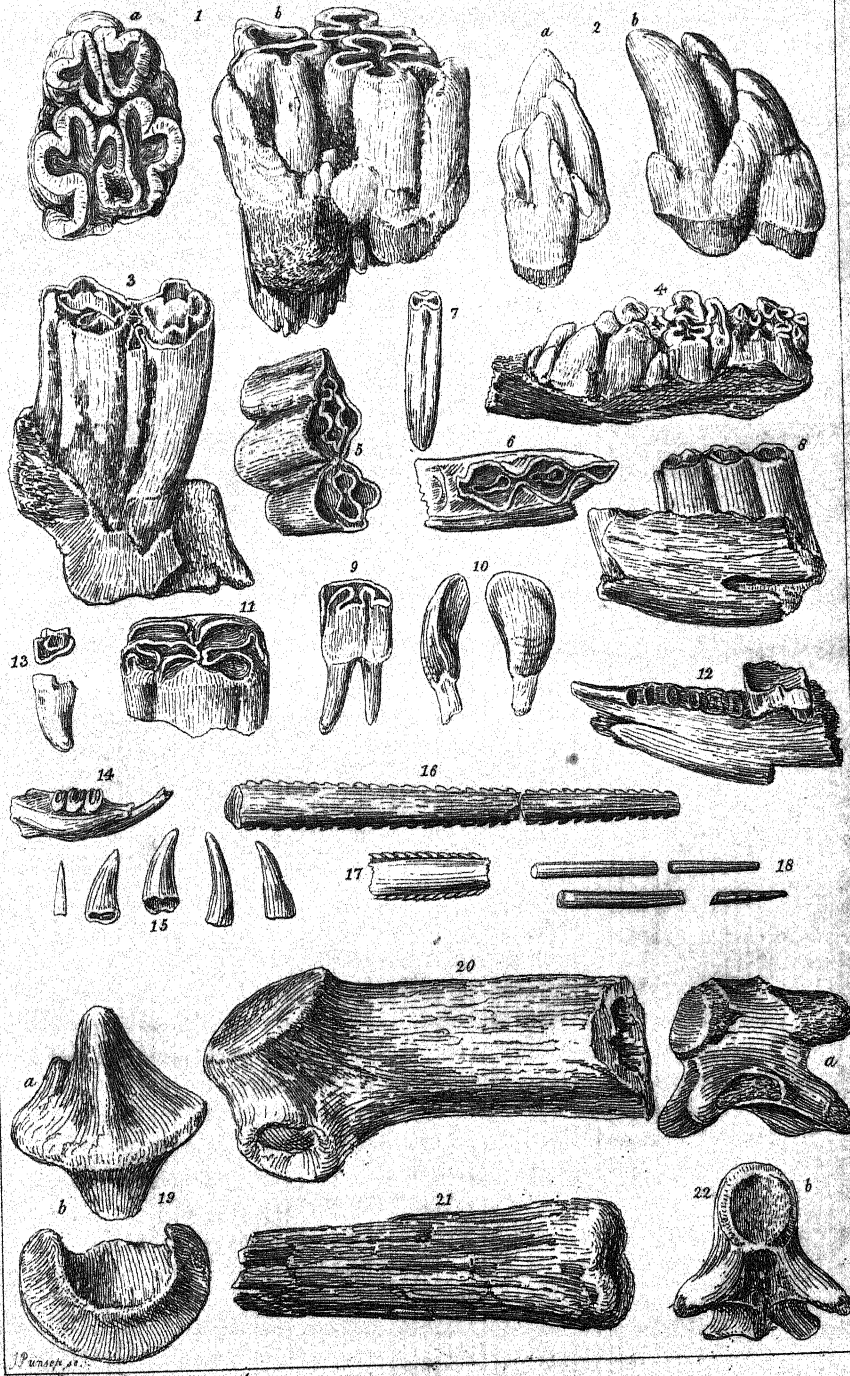
VI.—*On the Fossil Elk of the Himálaya. By Lieut.* W. E. BAKER, *Engineers.*

[In a note to the Editor.]

The fossils represented in the accompanying plate, XLIV., are stated by the natives who collected them to have been found in the Haripur pass of the Sub-Himálayan range. The original specimens are in the possession of Mr. DAWE of the Canal Department.

The fragment of antler (fig. 3,) appears undoubtedly to have belonged to a species of elk, and it is possible, that the two vertebræ (figs. 1 and 2) may have formed a part of the same animal: as they are stated to have been brought from the same locality, and this statement is corroborated by the similarity of colour and general appearance of the fossils. One of the vertebræ (fig. 2) was actually

Fossils from the bed of the Jumna River



Fossil Elk from the Sub-Himalayas.

1/5th Nat. Size.

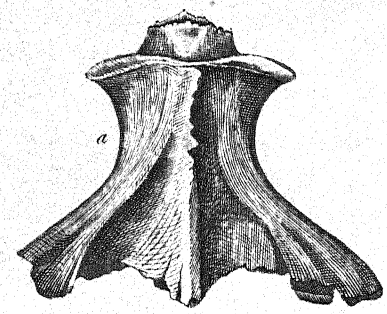


fig. 1.

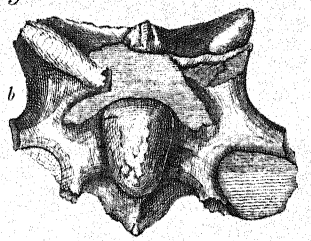
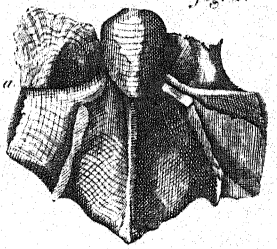


fig. 2.



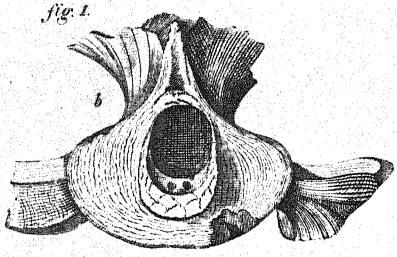


fig. 3.

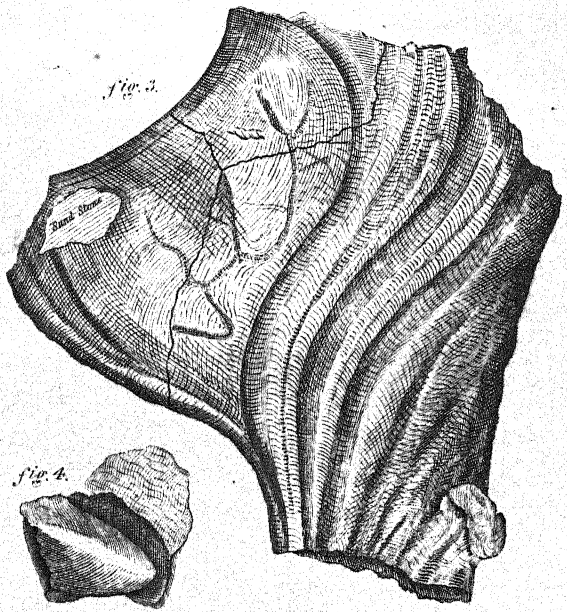


fig. 4.

Scale of Inches.

1 2 3 4 5 6 7 8 9 10 11 12

Hodges Sc.

adhering to the antler at the time when I undertook to clear away the sandstone with which they were all partially covered up.

The fragment (fig. 4) consisting of one of the occipital condyles of a large ruminant, was obtained afterwards from the same person who brought the others, and who stated that he had found it in the same spot. I purpose availing myself of the first opportunity of visiting this pass, where, from the admirable state of preservation of these specimens, I hope to meet with others equally perfect.

The axis (fig. 1) must have belonged to a very large ruminant, being in linear dimension about double the size of the corresponding bone of the common bullock of Hindustán. But supposing it to have belonged to our elk, it would appear that this individual at least did not in size equal the elk, of which the remains have been found in Europe.

Besides the specimens represented in the plate, there are in the Dadupur collection, many fragments of bones, more or less perfect, of gigantic ruminants: amongst others, cervical vertebræ, far exceeding in size that represented in fig. 2.

Another year will, I hope, give us a more perfect acquaintance with the former possessors of these huge fragments; in the mean time, it may be worth while to note the discovery of the first undoubted remains of the elk, as I am not aware that this animal has been hitherto found in a fossil state in India.

Dadupur, June 9th, 1835.

VII.—*Note on the Vegetable Impressions in Agates. By Mr.* J. Stephenson.

[In a letter to the Editor.]

A few of the scientific gentlemen of Calcutta, who have seen specimens of my collection of agates from the Sone river, having imbedded the organic remains of plants, have doubted the existence of such remains; asserting (agreeable to the old notion), that the appearances are ceased by *metallic oxides, merely assuming arborescent forms,* I am well aware, that long cherished opinions are difficult to eradicate, and most people are tenacious of parting with what they have hugged as truths for half a century. I well remember when Sir Humphrey Davy explained Lavoisier's beautiful theory of combustion, that a good many of my contemporaries would not be convinced, though demonstration stared them in the face; and it was only after years of argument, that they were compelled, at last, to embrace the new and

splendid discovery. My object in this communication is, to convince those who doubt the existence of organic remains in *agates* from the Sone river, or elsewhere. I therefore beg leave to refer them to the following passages in Dr. URE's Dictionary of Chemistry, published about fifteen years ago, which, in my humble opinion, establishes my point.

"These curious appearances (meaning the organic remains of plants) were ascribed to deposites of iron or manganese; but more lately they have been thought to arise from mineralized plants of the cryptogamous class." And again, "Dr. MCCULLOCH has recently detected what DAUBENTON merely conjectured, in *mocha stone* and *moss agates*, aquatic confervæ, unaltered both in colour and form, and also coated with iron oxide. Mosses and lichens have also been observed along with chlorite, in vegetations. An onyx agate, set in a ring, belonging to the Earl of POWIS, contains the chrysalis of a moth." I am also of opinion, that the arborescent appearance termed *Dendrites* in our magnesian limestone, and flag sand-stone, are the remains of mosses and lichens. I have several times tested the substance, but could only detect *carbon*, which certainly indicates their vegetable origin. I doubt not when they are effectually examined, but they will turn out to be the remains of vegetation."

The beautiful specimens from the sandstone of *Chunar* afford an excellent opportunity to those who may wish to set the matter at rest, and I must here remark, that you, as Secretary of the Asiatic Society of Calcutta, might easily accomplish the desired examination.

I also have another reason for troubling you with this communication. If the appearances in the agates *are not the remains of plants*, I have in that case asserted a *falsehood* in my advertisement, published in No. 39 of your Journal. However, with such authorities as the above mentioned, I need not fear again to assert, that the appearances in my agates are the real organic remains of aqueous plants, in a state of preservation not exceeded by any previous discovery, and altogether (as a collection), *unique*.

Dr. URE's Geology affords further proofs to strengthen my original opinion, that the appearances in my agates are truly the remains of plants; the passage runs thus:

"If any further evidence of the aqueous origin of chalcedonies and agates were wanted, it has been afforded by Dr. MCCULLOCH in an ingenious paper on the vegetable remains preserved in these siliceous minerals, published in the 3rd volume of the Transactions of the Geological Society. It is there shown that the mode in which the delicate vegetables thus become involved is perfectly simple, and consistent with the production of chalcedony. But we must distinguish their real causes, from pseudo specimens of black arborizations, produced by the oxides of manganese and iron, or by chlorite.

"When real confervæ are present, the vegetable form is so perfectly preserved that the plant seems to float freely as if in its liquid element. Even the green often retains its lively hue.

"Some of the large species of plants have been determined. DAUBENTON describes the *Lichen rangiferinus* and *digitatus*, plants possessed of forms which no minerals could imitate."

This account is accompanied with an engraving of a plant (a hypnum) occurring in Chalcedony, which agrees with a few in my collection; but a great many others, I dare say, are undescribed plants in a fossil state, and worthy the notice of the scientific world.

It cannot be otherwise than interesting to the Geologists of Europe, as well as to those in India, to have a description of the various species of fossil plants occurring in the Sone agates, with engravings of a few of the largest ones; and I will endeavour shortly to supply such a desideratum through your Journal as the fittest for such a purpose.

VIII.—*Chemical Analyses. By* JAS. PRINSEP, *Sec. &c.*

Under this head we propose to insert the examinations of various substances sent to us by friends, of which they will be better able to look for the results here than in detached miscellaneous notices.—ED.

1.—*Saltness of the Red Sea.*

The *Hugh Lindsay*, Steamer, having given currency to the report that the Red Sea contained more salt than the ocean, and that in consequence she had been obliged to blow off much more frequently while in that part of her voyage, Lieutenant BURNES, on his return to India on board of her, took the precaution of filling two bottles, one with the water of the Red Sea, the other with that of the Arabian Sea, which he was so kind as to send to me under charge of Lieutenant FRASER. (See Proc. Asiatic Society, page 410.)

After being allowed to stand for some hours side by side, to acquire the same temperature, their specific gravity was taken in the most accurate manner.

No. 1, Arabian Sea water, spec. grav. 1·0254 at 86°·1
2, Red Sea water,..... 1·0258 at 86°·2

The difference is certainly in favor of the latter, but it is much too small to cause any sensible effect in the blowing off.

Equal portions of the two were then analysed by the usual chemical tests, although the hydrometer result would have been quite sufficient to found a judgment upon. It was thought that perhaps the lime might be in excess in the one case, and thus cause a quicker incrustation in the boilers; but both waters on evaporation began to be turbid at the same time. The analysis was chiefly directed to the determination of the sulphuric acid and lime, the rest being performed in a rapid manner: the results were as follows on one cubic inch of each:

	Arabian Sea.	*Red Sea.*
Sulphuric acid, thrown down with barytes,	1·82 grs.	1·80
Lime, precipitated by oxalate of ammonia,	0·70	0·82
1000 grs. gave, with nitrate of silver, chloride of silver,.....	80·00	81·95
= chloride of sodium, or common salt,	32·8	33·5

Although, however, the sea in mid channel may not differ materially from the broad ocean in its contents, it may be possible that in insulated positions near shore, under a fierce sun, concentration may proceed to a considerable extent—this is the only way in which I can account for the very different result published in the London Literary Gazette, on the authority of Dr. URE's analyses quoted in Mr. WILKINSON's work on Egypt.

The following is the paragraph alluded to:

"During my stay on the coast of the Red Sea, I had occasion to observe the remarkable saltness of its water, and succeeded in ascertaining that it contained much more saline matter than the ocean. I have since been favoured by Dr. URE with the analysis of some water brought by me from Berenice, from which it results that the specific gravity is 1·035; that 1000 grains of water contain 43 of saline matter, of which about four grains are muriate of lime, with a little muriate of magnesia, and the remainder muriate of soda, with a little sulphate of magnesia. The specific gravity of water of the open ocean in the same latitude is only 1·028, and contains not more than 36 grains of saline matter in a similar quantity."

To which the author attaches a note, explaining, that "after the vernal equinox, the Red Sea is lower in winter; but the prevalence of the south wind after the month of September causes a considerable rise of its level."

The difference in the two cases is not more than may reasonably be explained in the above manner. The hydrometer is in all cases the safest test, and it is a pity that it had not been resorted to in the steam navigation of the Mediterranean, which has been the source of such contradictory statements.

2.—Native Carbonate of Magnesia from South India.

In my analysis of the Nerbudda dolomite, published in the *Gleanings in Science*, vol. I. p. 267, I expressed a desire to obtain some of this mineral, stated by Dr. THOMSON to form "whole rocks in Hindustan, and to contain much less carbonic acid than it ought," though he was curious to know whether the interior portions of the mountain might not have their full proportion.

My wish has at length been gratified by Dr. MALCOLMSON, Sec. Med. Bd. at Madras, among whose specimens, recently presented to

the Society, are several lumps of this curious mineral. Dr. M. writes:

"The native carbonate of magnesia from Salem has again attracted attention. I at first supposed it to be a magnesite, from the great difficulty of dissolving it, but subsequent observation proved it to contain no silex. Its composition would seem to be, carbonic acid 47·5; water 4·0*; magnesia 48·5. As it is likely to become an article of commerce, and the statements regarding it are contradictory, I send some for your re-examination. It occurs in thin veins (from an inch to a foot), and also, (it is said,) in beds."

As the atomic weight of magnesia differs materially in different chemical works, I was anxious to make use of this mineral to set the matter at rest, and decide whether BERZELIUS, THOMSON, or BRANDE was most to be trusted.

Three careful experiments proved, that the water contained was 0·8 per cent., while the slight adulteration of silica left, on dissolving 100 grs., was only 0·3; traces of alumina and oxide of iron were visible in the form of a delicate brown gelatinous film on adding ammonia to the solution, but none of lime, even after adding sulphuric or oxalic acid, evaporating to dryness, and redissolving in distilled water. The solid impurities, therefore, being set against the gaseous, as nearly in the proportions of the magnesian salt itself, it is evident that simple calcination of the solid mineral will give a very exact view of its constituent proportions.

Ten specimens of 100 grs. each, treated in this manner, returned from the fire, weighing respectively, 49·67, 48·26, 48·20, 48·40, 48·40, 48·38, 48·39, 48·33, 48·37, and 48·38. The first of these was in the solid form, and therefore may not have been thoroughly calcined: the average of the rest gives,

Magnesia,....	48·34 by BERZELIUS	48·31†
Carbonic acid,	51·66	51·69
	100.	100.

or almost precisely the composition according to this accurate chemist—which it may be remembered was the only one which would agree with my analysis of the *Jabalpur* dolomite, a definite crystallized compound of one atom of carbonate of lime and one of carbonate of magnesia.

To prove that no influential quantity of carbonic acid was retained, two of the specimens were dissolved in dilute nitric acid, in a closed glass tube—the gas extricated was less than the 50th of a cubic inch.

* Dr. MALCOLMSON afterwards corrects this error. A part of the carbonic acid was driven off with the water.

† By Dr. THOMSON, *M.* 46·2 *C. A.* 53·8; by BRANDE *M.* 47·2; *C. A.* 52·8.

The mineral was found to differ considerably in weight from the statements of THOMSON and PHILLIPS—the specific gravity of two specimens being 2·970, and 2·897, at the temperature of 85°. A good deal of air was given off on its first immersion into water, and it adhered to the tongue.

Another point to be ascertained, from this mineral, was, whether the circumstance I noticed on the occasion alluded to, would hold true, viz. that calcined magnesia would not become a hydrate, like lime, on slaking, and that this earth might thus be recognized in mixtures.

Three of the calcined specimens were treated with water, which disengaged considerable heat, and then exposed in a receiver, over concentrated sulphuric acid, to be ridden of hygrometric moisture. After 30 hours, they weighed respectively 60·45, 58·7, 60·9 grs., shewing an average excess of 10·0, which is about half an atom of water (9·8). This result is so unexpected that it requires further examination, which I hope to be able to give hereafter.

3.—*Tin from Malacca.*

Cast blocks of the metal of the principal mines, as prepared for sale, were transmitted by Ensign NEWBOLD. With reference to my observation in the 3rd vol. of the GLEANINGS, I was contented to test their purity by the specific gravity, which was as follows :—pure tin, at the same temperature, 84°·5, being about ..... 7·290

No. 1,	from	Naning.....	7·317
No. 2,	,,	Srimenanti (new mine)	7·262
No. 3,	,,	Jompole.....	7·287
No. 4,	,,	Sungie Oojong.....	7·223
No. 5,	,,	Lúkút in Salangore.....	7·349
No. 6,	,,	Rumbowe.....	7·256
No. 7,	,,	Jelaboo.....	7·314
No. 8,	,,	Perak.....	7·299

Two specimens of the ore also accompanied :—

No. 1, from Lúkút, a fine grained black oxide of tin, had a specifie gravity of 6·74, and yielded a produce of 70 per cent. of very good metal, on simple fusion, with black flux.

No. 2, from Srimenanti, was in much larger grains or lumps. It weighed, however, only 6·64 ; and yielded only 52½ (?) per cent. of metal—giving off some sulphur in the fire. It is therefore inferior to the former, but probably not to the extent stated in the above crude and single reduction.

4.—*American Self-generating Gas Lamp.*

Mr. LONGUEVILLE CLARKE has one of these curious and ingenious lamps, which are something on the principle of the little floating

candlesticks without oil, invented, I believe, by WOOLASTON. A metal stem passes down into the liquid, and, once heated, is afterwards kept warm by the burning vapour, which it causes to rise and issue from the gas-jets encircling the stem. Some mystery is made about the liquid, but its analysis proves to be very simple.

Specific gravity, ·760 at 32°; easily volatile, with a smell of turpentine. 100 grs. allowed to evaporate spontaneously, left barely a trace of solid matter—resinous. 100 parts, mixed with water in a measured tube, turned white, and 15 parts of pure colourless turpentine finally settled at the top of the watery emulsion. In fact, a mixture of 85 alcohol, and 15 turpentine was found to possess precisely the qualities of the liquid, burning with a clear flame, and without smell.

It is necessary to use the oil of, and not the rectified, turpentine, which latter is well known not to be soluble in alcohol.

5.—Native Remedy for the Spleen.

The late Dr. TWINING gave me some pills used by the natives as a cure for the spleen. They proved to contain nothing but sulphate of copper, mixed up with meal and mucilage.

6.—Three bottles of Water from Hot Springs in Assam.

Captain JENKINS is anxious for the result of their examination; but I really am uncertain of two, which arrived in a dirty and odorous state—one, No. 3, containing an abundant putrid yellow scum, which appeared like a compound of bitumen and sulphuretted hydrogen, but was not further examined. No. 1, was a clear sweet water, having a specific gravity, ·9964 at 91°, and containing only common salt.

7.—Mineral Water from Ava.

CAPTAIN MACLEOD favoured me with a bottle of water from the lake near the Khyendwen river, whence a mineral salt is obtained. It had a spec. grav. of .9985 at 88°, and was consequently nearly pure. But a second bottle, filled from a well only three feet from the same lake, weighed 1·0006 at 88°, and yielded a copious precipitate to muriate of barytes, and nitrate of silver, shewing it to contain a mixture of sulphates and muriates, which are extracted by the people of the neighbourhood.

8.—Hot Springs in the Mahadeo hills, (see Vol. III. p. 390.)

The two bottles sent me by Dr. SPILSBURY were so nearly pure, that it was not worth while to examine them further than by the hydrometer.

9.—Minerals from Moulmien.

The following are, I believe, the correct names of the specimens obligingly sent by Lieut. FOLEY, in June. Nos. 1, 4, 16, irom pyrites; 2, galena; 3, sulphuret of antimony; 8, 9, hydrated oxide of iron, hæmatitic; 10, fibrous gypsum; 11, magnetic oxide of iron; 12, 14, 17, granite with pseudo-metallic mica; 13, black oxide of tin.

10.—*Sulphuret of Molybdenum.*

This was put into my hands by a mercantile house in Calcutta, without however noticing whence it came.

It resembled graphite or plumbago so exactly in its qualities of drawing traces on paper, of being unaltered in the fire, and very gradually disappearing, that I should have been contented with these appearances, had not its specific gravity, 4·64 to 4·5, been so much higher than that of graphite, (1·4.) When heated also, white fumes, devoid of smell, or slightly sulphurous, were perceived at the moment of withdrawal from the fire.

It was digested with disengagement of red fumes in nitric acid; leaving a white insoluble precipitate in the filter, weighing 74·4 per cent. The liquid gave immediate evidence of sulphuric acid, that had been formed from the sulphur present. The white mass acted in all respects like molybdic acid, and was known to be so from its peculiar property of turning instantly blue on contact with metallic iron, lead, copper, or silver: a fact, I believe, not hitherto noticed: water is required to produce this effect. Heated red with carbonate of soda, the metal was reduced with effervescence.

I am not aware that this singular mineral is turned to any profit, but it is desirable to ascertain where it has been discovered. The high specific gravity of the Ceylon graphite, 2·37, leads me to imagine that I may have mistaken that mineral also, and invites further inquiry. It may be remembered*, that in an English cabinet of minerals, a metallic ore was also found substituted for the true Borrowdale plumbago.

IX.—*Horary Meteorological Register for Calcutta.* *By* JAS. PRINSEP, *Sec. &c.*

The 21st September having been appointed one of the days for the combined series of horary observations, by the Meteorological Association, I could not allow it to pass without an attempt to fulfil the prescribed terms, even at the sacrifice of a night's rest.

The weather was not very favorable, although such as might be expected near the equinox: the barometer was gradually falling, indicative of blowing weather; which in fact followed a few days afterwards. The occasional violent showers checked the course of the thermometer and hygrometer; and the minimum temperature noted, was that of the rain, rather than that of radiation to the sky. As a different barometer was necessarily used during the night, care was taken to continue its readings during the day, to obtain an accurate comparison with the standard instrument at the Assay Office. The difference—·017, has been added, to bring the whole to terms of the

* See Analysis of Graphite, GLEANINGS, vol. III. p. 180.

standard, which I have reason to believe does not differ more than ·010 (in defect) from the Royal Society's barometer.

The thermometers were all standards from NEWMAN'S, agreeing very closely together.

The diurnal tides for the two days are respectively 0·140 and 0·116, from the former of which must be deducted the gradual decrease of the pressure for 6 hours; $\overline{732} - \overline{663} \div 4 = \cdot 017$, leaving 0·123, and $\overline{116} + \cdot 123 \div 2 = 0 \cdot 120$ is the mean, which is rather above the usual amount of tide for the month of September. The nocturnal tide from $10\frac{1}{2}$ P. M. to $4\frac{1}{2}$ A. M. is ·700—·607 (with allowance for the half hours) = ·083. The hours of maxima and minima correspond with those used in the registers of the Journal, and suggest the expediency of an alteration in those fixed for observation by Sir JOHN HERSCHEL, (see page 358.)

Horary observations of the Barometer, Thermometer, and Hygrometer, made at Calcutta, from 6 A. M. of the 21st to 6 P. M. of the 22nd September, 1835.

Hour 21st.	Barometer at 32°	Thermometer in the Air.	Thermometer in the Under sky.	Wet bulb therm.	wet bulb depression.	Hair hygrometer.	Rain.	Wind.	Weather.
A. M. 6	29.678	78.0	75.2	75.8	2.2			E.	Scud, cirri above.
7	.699	79.4		76.2	3.2			e.	do., increasing.
8	.715	80.0		76.5	3.5			o.	cumuli, clear above.
9	.725	81.8	80.0	76.8	5.0			e.	do.
10	.732	85.0	85.2	78.1	6.9			e.	cumuli.
11	.702	84.7	97.0	77.7	7.0	95		E.	do., fine.
noon.	.684	85.6	100.0	78.4	7.2	94		E.	do.
1	.656	86.0	96.2	78.3	7.7	93		e.	overcast.
2	.621	79.2	91.0	78.6	0.6	100		e.	hard shower, clear.
3	.592	83.1	102.4	78.8	4.3	97		e.	fair.
4	.592	82.2	88.2	78.6	3.6	97		e.	cloudy.
5	.595	82.3	85.7	78.7	3.6	97		e.	do.
6	.605	83.7	(rain.)	78.6	5.1			e.	cumuli, rain $6\frac{1}{2}$ p.m.
7	.646	78.5	74.0	76.8	1.7			o.	rain.
8	.657	79.7		77.5	2.2			e.	overcast.
9	.688	80.1		77.4	2.7			E.	do., clearing.
10	.696	79.5	76.8	76.5	3.0			e,	clear night.
11	.699	79.1		76.4	2.7		0.40	e.	do.
midnight.	.682	78.4		76.2	2.2			e.	do.
22nd. 1	.658	77.8		76.4	1.4			e.	do.
2	.653	77.6		76.4	1.2			e.	cloudy.
3	.636	77.7		76.5	1.2			e.	overcast.
4	.618	77.5	75.7	76.3	1.2			e.	do.
5	.621	77.7		76.8	1.1			E.	cum. stratus.
6	.643	77.7	76.8	76.4	1.3			E.	do., wet.
7	.646	78.3		76.5	1.8			E.	do.
8	.654	79.1		76.6	2.5			E.	do., clearing.
9	.662	80.3		77.1	3.2			E.	scud.
10	.663	83.0		78.1	4.9			E.	fine.
11	.647	83.9		79.6	4.2	96		E.	cumuli.
noon.	.620	83.4	93.0	77.4	6.0	94		E.	do.
1	.595	80.4	83.2	77.6	2.8	99		E.	rain, dull.
2	.568	81.5	88.4	77.5	4.0	98		E.	cumuli.
3	.544	81.5	85.8	77.5	4.0	98		E.	overcast.
4	.544	80.4	79.6	76.6	3.8	99		e.	hard rain.
5	.547	79.2	79.0	77.2	2.0	99		e.	do.
6	.574	×77.6		75.7	1.9		0.60	E.	clearing.
Mean 1st 24hours,	29.6605	80.61		77.26	3.35		0.40	e byn	showery.
Mean 2d 24hours,	29.6317	79.58		76.96	2.62		0.60	ebys	ditto.

X.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 7th October, 1835.

The Hon'ble Sir EDWARD RYAN, President, in the chair.

Messrs. J. BELL, G. LOCH, C. S., J. M. MCLEOD, Mad. C. S., and Lieuts. H. M. DURAND and W. E. BAKER, Engineers, proposed at the last Meeting, were ballotted for, and unanimously elected Members of the Society.

Mr. J. STEPHENSON, proposed at the last meeting, was, upon the favourable report of the Committee of Papers, elected an Associate Member.

Read a letter from G. A. BUSHBY, Esq., Secretary to Government, intimating, that the Society's Memorial would be dispatched by an early opportunity.

Read a letter from J. C. C. SUTHERLAND, Esq., Secy. Genl. Com. Pub. Instr., forwarding the list of Oriental Books, transferable to the Society.

Read a letter from M. A. COURT, acknowledging his election as an Honorary Member.

Read a letter from M. E. BURNOUF, Secretary to the Asiatic Society of Paris, acknowledging the receipt of Volume XVIII. of the Asiatic Researches.

Read letters from J. FORSHALL, Esq. Secretary to the British Museum, and H. HARKNESS, Secretary to the Royal Asiatic Society of Great Britain and Ireland, acknowledging the receipt of copies of M. CSOMA DE KÖRÖS's Tibetan and English Dictionary.

Read a letter from Professor H. H. WILSON, forwarding statements of the Society's accounts with Messrs. PARBURY and Co., made up to the end of December last, exhibiting a balance of £23 11*s.* 1*d.* in favor of the Society.

Library.

Read a letter from Counsellor VON HAMMER, forwarding for presentation the undermentioned books published by himself.

History of the Ottoman Empire, vol. 10th.

Jahrbucher der Literature, vols. 65, 66, 67, and 68.

Uber die Länderverwaltung unter dem Chalifate.

The following Books were also presented:

Statuti del l' Accademia delle Scienze e Belle Lettere—*by the Academy of Palermo.*

De redigendis ad unicam seriem comparabilem meteorologicis ubique factis observationibus Conventio Proposita et Tabulæ Supputatæ ab Equite Nicolao Cacciatore—*by the Author.*

CLOUGH's Pali Grammar, with a copious Vocabulary, 1 vol., and a Dictionary English and Singalese, 2 vols.—*by the Author.*

Journal of the Royal Asiatic Society, No. 3—*by the Society.*

Moor's Oriental Fragments—*by the Author.*

Proceedings of the Geological Society of London, No. 37—*by the Society.*

The Indian Journal of Medical Science, No. 22—*by the Editor.*

ROODRA VAN EYSINGA'S Dutch and Malay Dictionary, 2 vols. and ANGLEBEEK'S Malay Grammar, 1 vol.—*by Dr. Vos.*

Hikaitismyateem, 1 vol. Malay Language and Character—*by ditto.*

Meteorological Register for August, 1835—*by the Surveyor General.*

A copy of the Tibetan, Mongol, and Chinese Vocabulary, alluded to in M. KLAPROTH'S notice sur le Tibet, procured through Mr. INGLIS of Canton, and presented by the Secretary.

The following Books received from the Book-sellers:

Illustrations of the Botany and other branches of the Natural History of the Himalayan mountains, by J. F. ROYLE, Esq. F. L. S. and G. S. M. R. A. S.

SOWERBY'S Fossil Conchology.

LARDNER'S Cabinet Cyclopedia, Germanic Empire, vol. 2nd.

————————————, Ireland, vol. 1st.

Museum.

A variety of bows, arrows, and other weapons from Chota Nagpore, Singhbhúm, and the Jungle Mehals, were presented by Lieut. G. W. Hamilton, 34th Regt. N. I.

Prepared skeleton of the hood of a Cobra de Capello Snake, presented by Colonel L. R. Stacy.

Literary.

Read a letter from Lieut. G. W. Hamilton, 34th Regt. N. I., forwarding two manuscript volumes of a poetical translation of part of the Sháh Námeh of Firdausí, by the late Francis Gold, Esq., Assistant Surgeon, 34th Regt. N. I.

Physical.

A memoir, with drawings, of the *Sivatherium Giganteum*, a new fossil ruminant genus from the valley of the *Markanda*, by Dr. Falconer and Captain P. J. Cautley, was read.

Also, a notice of the fossil Crocodile of the *Sewalik* Hills, by Captain Cautley.

Minerals from the neighbourhood of Kabul were forwarded by Syed Kera'mat Ali, for presentation; also a large supply of flower and fruit seeds and medicinal drugs, from the same place, and a further collection of Bactrian coins for inspection.

The seeds were directed to be transmitted to the H. C. Botanical Garden, with a request that they might be examined, and bestowed to the best advantage. The medical drugs, in like manner, to be transferred to the Medical Society.

The collection of Coins, consisting of about 750 pieces, 11 gold, 72 silver, and the rest copper, possesses one silver Euthydemus; one ditto Antilakides, (new;) two ditto Menanders; one ditto Lysius, (new;) a fine gold Kadphises. The remainder are of the Indo-Scythic, Sassanian, and Khálif dynasties.

The minerals collected by the praiseworthy and intelligent Syed are some from the neighbourhood of Kabul, and others from Demavend, &c. in Persia. Among others, a fine green talcose sectile steatite or agalmatolite from Kabul, native sulphur, gypsum, specular iron in large laminæ, &c.

A letter from Captain Conolly, accompanying the despatch, states that Kera'mat Ali has collected a large store of statistical information during his stay at Kábul while agent for the British Government, which it is his intention to put together for publication in Persian.

At the conclusion of the business of the evening, the Secretary exhibited a very powerful electro-magnet, lately received from London, which produced a brilliant spark, decomposed water freely, imparted a considerable galvanic shock to the human body, and lighted a spirit lamp.

XI.—*Extracts from Correspondence.*

1.—*Semimenstrual Inequality of the Tides.*

[We hasten to publish the following letter from the Rev. W. Whewell, of Cambridge, in correction of a quotation from the learned Professor's Essay on Cotidal Lines in our editorial notice of Mr. Sinclair's tables of the Calcutta tides, in the third volume of the Journal, p. 408. We regret that the period fixed for the contemporaneous observations on the shores of England should have passed: but we once more repeat a request to our friends on the coast to furnish the information now called for.—Ed.]

"In the number of your Journal for August, 1833, is given a table of the times of high water at the principal places between Calcutta and Point Palmiras, by Mr. P. A. Sinclair: an addition to our previous materials for a map of

Cotidal Lines which I saw with much pleasure. But I am desirous of removing a misapprehension which I perceive in the remarks accompanying this table. Mr. SINCLAIR has given the time of high water for every day of the moon's age, at the places contained in his table, calculated on the supposition of a daily retardation of the tide, to the amount of 48 minutes : and in the remarks a rule is quoted from my paper for the correction of the time so given. But the rule quoted is erroneous for the purpose there stated. The rule which should have been given is the following nearly.

Correction to be applied to the time of high water calculated by supposing it to be always at the same interval after the moon's transit as it is on the days of new and full moon.

Time of moon's preceding transit, hours.	0	1	2	3	4	5	6	7	8	9	10	11
Correction, ... minutes,	0	−16	−31	−46	−61	−72	−75	−65	−34	0	+13	+11

The fact is, that the correction quoted from my paper belongs theoretically to the "correct establishment," or mean of all the intervals of moon's transit and tide, not to the "vulgar establishment" or interval of moon's travel and tide on the day of new and full moon, which is the establishment taken by Mr. SINCLAIR.

The correction which I have given above is probably not exact for India, for it is taken from the London Tide Observations ; and it would be extremely desirable, as you have observed in your Journal, to verify or correct it by observations at some stations in the Indian seas, made daily for a sufficient length of time. I may add, that the above correction is what has been called the *semimenstrual inequality*, and does not arise from the inequality of the moon's daily motion, but from the varying angular distance of the moon from the sun, in consequence of which the solar tide sometimes coincides with the lunar, and at other times is separated from it by a large angle.

I am very glad to find you expressing your hopes that you will be furnished by your correspondents with tide observations from an extensive range of places in India. I would observe, that for the purposes of science, the daily observations themselves are much more valuable than the "establishment," or any other inference collected from them.

In conclusion, I would beg particularly to state, that directions have been given for tide observations on the whole coast of England from the 9th to the 22nd of June in this year: that I have strong hopes that these observations will also take place on the shores of other states of Europe and America, at the same time; and that it would be very interesting and useful to have contemporary observations made on the shores of India at as many places as possible."

March 21, 1835.

2.—*Mr.* TAYLOR'S *mode of determining the Errors of Division in Astronomical Instruments.*

[Extract of a letter from Sir JOHN HERSCHEL, dated C. G. H. April 20, 1835.]

Feldhausen, near Wanbey, C. G. H.

"The Journal for August, 1834, contains Mr. TAYLOR'S application of the collimating principle to the examination of the mural circle at Madras. It is somewhat singular, that not long before I had suggested to Mr. MACLEAN, the Astronomer Royal here, and had also written to Professor AIRY at Cambridge,

suggesting its application to the circles in the British Observatories, as the only fundamental mode of enquiry into their errors, a process which coincides in almost every particular with that adopted by Mr. TAYLOR, and which amounts in fact to an aerial *re-division* of the circle in situ.

"I do not mention this as in any degree wishing to interfere with Mr. TAYLOR's just claim to independence and priority of invention; but as I consider the method in question to be one of great importance, and likely to supersede every other method of examination, I wish to obviate any misconception which may arise from the appearance in England in any of the journals, &c. of this method, as proposed by myself, without mention made of Mr. TAYLOR's name---what he had done being then entirely unknown to myself, and my own thoughts having been turned upon the subject in the course of a severe examination to which Mr. MACLEAN has been subjecting the Cape circle, and respecting which he did me the honor to consult me."

3.—*On a simple mode of Correcting the Index Error in taking observations for latitude.* *By Lieut.* W. P. JACOB, *Bombay Engineers.*

[In a letter to the Secretary As. Soc.]

I send you the results of a few observations, made lately at Karanja and Bombay, in illustration of a very simple method by which the errors of an altitude instrument, when employed in finding the latitude of a place, may be rendered insensible. It consists in observing pairs of stars which have nearly the same meridian altitude, the one N. and the other S. The errors of both in altitude will then be the same, but with respect to the pole they will be in opposite directions, so that the latitude resulting from the mean of the two will be free, not only from the errors of the instrument, but also from those caused by the uncertainty of refraction.

In the present instance, the instrument employed was a 10 in. circle, reading 10," which had been subjected to very rough usage, having more than once been bent and reflattened, so that its errors sometimes amount to 40" or more; each star was observed four times, twice with face to the right, and twice to the left, and the observations were afterwards reduced to the meridian, an operation which is very easily and quickly performed by means of the sliding rule:

At Karanja.			At Bombay Light house.		
Stars obsd.	Latitude.	Mean of each pair.	Stars obsd.	Latitude.	Mean of each pair.
β Cephei,	18 51 07.0	18 51 19.3	α Persei,.. ..	18 53 23.0	18 53 32.2
α Pisc.Aust.	18 51 31.6		γ Eridani, ..	18 53 41.4	
α Persei,..	18 51 07.6	18 51 15.5	α Geminorum,	18 52 28.3	18 53 34.4
γ Eridani,	18 51 23.4		α Cans. Mins.	18 53 40.5	
		18 51 17.4			
Diff. Lat. of Karanja and Light house by Trig. Survey,		+2 16.6			
		18 53 34.0	Lat. of Light house,.....		18 53 33.3

Here while the individual observations differ greatly, the several pairs have a close agreement, and would doubtless have been still nearer, had the altitudes been more nearly equal, for α Persei and γ Eridani differed more than 2° in alt.

By this method with a moderately good instrument, the Latitude might be found in one night within 1", or much nearer, supposing the catalogues correct.

Mahadeo, 4th March, 1835.

[The method pointed out by Lieut. JACOB is so obvious as to have been, we imagine, at all times practised by astronomers; we however give insertion to it as likely to furnish an useful hint to amateurs and beginners.—ED.]

4.—*Fossil Shells found in the Kasya Hills. By Dr.* McCLELLAND.

"Though not two days in these hills, I have found about a thousand specimens of sea shells, at various altitudes, from 1000 to 4200 feet, and even in and around the station of Churra Punjí itself. On a hasty glance, I think I have recognised of known genera, Pectens, Cardiums, Turritella, Teredo, Serpula, Melonia, Cirrus, and Pleurotoma, among my collection; but many will probably be found on examination to be new genera, and all the species or many of them at least will be found to be new.

"What makes the discovery of these remains of more consequence is, that I have found them in rocks that have been hitherto considered as primitive in India, at least; but we shall now be able to correct our classification, and to remove many contradictions that exist between the result of Indian and European observations!!

"The *Ponar* Fossil is here in great perfection, and is connected with the numulites; but it must come into a new genus, or sub-genus, which may be called annulite; it was the thing that first struck WALLICH and GRIFFITH in the rocks of the Doli river, at the base of the hills, though I did not point it out."

5.—*Note on the Pea Stalactite of Tibet. By Mr.* STEVENSON.

The accompanying sample of a calcareous concretion was a few months ago sent to me for examination, from Dr. CAMPBELL of Nípál, and found in *Tibet*. The mineral is used in medicine by the Tibetans, and called *Kári* by the inhabitants of *Nipál*.

It appears to me to be a variety of the *Roe-stone* of geologists, in a disintegrated state, probably washed from its matrix by hill torrents, and deposited in pools.

A careful analysis of an average from the bulk gave me the following result:

Description. In globular concretions, from the size of a grain of mustard seed, to that of a *pea*; colour cream yellow, and a few slightly tinged blue, very compact —hardness equal to statuary marble, externally opake, internally crystalline, crystals needle-like, and radiated from the centre of each globule. Effervesces strongly in sulphuric, nitric, and muriatic acids, in which it readily dissolves, leaving a few grains of various coloured sand.

According to my analysis, it is composed of,

Carbonate of lime,	90.
Alumina,	5.
Silica, or sand of various colours,	5.
	100.

If I may be allowed to venture an opinion, I would say, that it is a *new mineral*, or one not described in any of the European scientific journals. If so, Dr. CAMPBELL will be entitled to the thanks of mineralogists, for his discovery. I would (though with diffidence) suggest that the mineral sh ould be named *Campbellite*, or *Tibetan comfits*, though the latter is not a scientific name, notwithstanding its comfit-like appearance.

6.—*Observations of Halley's Comet, made at the Honorable Company's Observatory at Madras.*

The comet first made its appearance on the 30th August, at 15th. 40m. mean time, astronomical reckoning, or August 31st, at 3h. 40m. A. M. civil reckoning —the observation are as follows :

		Madras M. T.			Right Ascension.			Declination.		
1835	D.	h.	m.	s.	h.	m.	s.	h.	m.	s.
Aug.	30	15	47	30	5	42	22	+24	43	0
	31	15	33	28	5	49	52	24	50	0
Sept.	19	15	39	40	6	10	57	29	36	30
	20	15	6	48	6	12	43	30	0	6
	23	14	54	51	6	17	29	31	36	46
	26	4	22	59	6	24	39	33	49	15

From the above observations, it would appear that the comet is about ten days later than the time predicted for its return.—At present it is invisible to the unassisted eye of *ordinary* observers, and will probably remain so until the 21st of October, when it will be situated in the constellation Coronæ Borealis, near to β, the proper time to look for it on this day will be immediately after sun-set.

T. G. Taylor,

September 28, 1835. *H. C. Astronomer.*

[The comet has been visible here since the 12th Oct., after sun-set, and is now very bright.—Ed.]

A French translation of Lieutenant Burnes's interesting Travels to Bokhara, &c. has been announced as in preparation at Paris, with notes, by Klaproth, the distinguished orientalist.—*Foreign Quarterly Review.*

XII.—*Illustrations of Nipalese Zoology, prepared for publication.*

[We have been requested to insert this catalogue in continuation of the Prospectus published in p. 356.—Ed.]

MAMMALIA.

Part 1st.

Plate I.—The Jharal, wild goat. *Capra jharal*, mihi, mature male. Inhabits the Kachar.

Plate II.—The Nahoor, wild sheep. *Ovis Nahoor*, mihi. Fig. 1, the mature male; 2, the head of mature female; 3, young male. Habitat. Kachar.

Plate III. fig. 1, the Thar antelope. *Antelope Thar*, mihi, mature male; figure 2, the Ghoral antelope. *A. Ghoral*, Hardwicke. Mature male. Inhabit central and northern divisions of Nipal respectively.

Plate IV. fig. 1, female Ghoral; fig. 2, young male.

Plate V.—The Changra or shawl goat of the Himálaya towards Nipal. Fig. 1, the larger or true shawl goat; figure 2, the lesser variety. Inhabit the Kachar.

Plate VI.—Sculls. Figs. 1 and 2, the Jhâral mas.; 3 and 4, the Nahoor fem.; 5 and 6, the Thar mas.; 7 and 8, the Ghoral mas.; 9 and 10, the Banbhera, or Himálayan variety of Ovis. Ammon. mas. junior; 11 and 12, the Phusro Jaraï, or Cervus Aristotelis. Horns cast. mas.; 13 and 14, the Ratwa Mantjac, mas. (N. B. Several of the sculls, with the horns torn off, show the cellular cavity of the core.)

Plate VII. figs. 1 and 2, head of the larger Changra; 3 and 4, scull of the lesser.

Plate VIII. fig. 1, head of the Thar, mature male; 2, scull of ditto; 3, fore-foot, and 4, hind foot of ditto.

Plate IX. fig. 1, head of the Chiru antelope, mature male; 2, direct front view of the nose of ditto, showing the position of the intermaxillary pouch and its connexion with the nares; 3, scull of ditto; 4, the inguinal pouch of ditto.

Plate X.—The Chiru antelope. *Antelope Hodgsonii*, C. ABEL, mature male. *A. Gazella* of H. SMITH's sub-genus. Habitat. the open plains of N. E. Thibet; fig. 2, represents the female.

Part 2nd.

Plate I. fig. 1, the male; 2, the female; and 3, the young male of the Ratwa Mantjac. Inhabits the central region of Nipal.

Plate II.—The Nipalese Paradoxurus. *P. Nipalensis*, mihi, mature female. Inhabits central and northern regions of Nipal.

Plate III.—The Wah. *Ailurus Fulgens*, mature male. Figs. 2 and 3, showing the attitudes of repose of the same. Kachar only.

Plate IV.—The Kathiah Nyool of Nipal. *Martes Kathiah*, mihi. Central and northern regions.

Plate V.—The Bharsiah of the Nipalese, mature male. *Ursitaxus Inauritus*, mihi. PENNANT'S Indian Badger? Fig. 1, the head of ditto, natural size; 2, scull of ditto, ditto; 3 and 4, direct and oblique views of the lower jaw; 5 and 6, ditto ditto of the upper jaw; 7, the fore foot, and 8, the hind.

Plate VI.—The Koïral of the Nipalese. *Sciuropterus magnificus*, mihi. Central and lower regions of Nipal.

Plate VII.—Different views of the preceding.

Plate VIII.—Head of the Ratwa Mantjac, mature male.

Plate IX.—Head and members of the Nipalese Paradoxurus. Fem.: 1-1, vulva and glands; 2-2, anus and pores; 3, fore foot; 4 and 5, hind foot.

Plate X.—Scull of the same animal.

Plate XI.—Front and side views of the head of the Wah. Figs. 1 and 2 exhibit the ear, denuded of all hair, and invested with it; 3, the fore foot (sole of); and 4, the hind foot.

Part 3rd.

Plate I.—The Machabba, or Malva of the Taraï. *Paradoxurus Bondar?* Inhabits the open tracts of the lower region of Nipal. Figs. 1 and 2, side and front views of the head; 3, sole of hind foot.

Plate II.—Thulo Chuah of the Nipalese. Norway Rat? all parts of Nipal.

Plate III. fig. 1, the Nyool of the Taraï. *Mangasta Cafra?* 2, the Nyool of the hills. *M.* Javanica?* Central region of Nepal.

Plate IV. fig. 1, *Viverra Indica*. The Sayer of the Taraï; 2, *Viverra Rasse*, also called Sayer. Both inhabit the Taraï portion of the lower region of Nipal exclusively; 3, head of Rasse; 4, ditto of Indica; 5 and 6, anal and genital parts, with the skin on and off; 7, the hind foot to the tarsus; 8, head of Rasse.

Plate V.—The Chittra Bilow of the Taraï. *Felis Serval?* varietas, mature male. *Felis Viverrinus* of HARDWICKE? Open parts of lower region of Nipal only.

Plate VI.—The Biraloo of the Nipalese. *Felis Lynchus Erythrotus*, mihi. Central region and lower; 2, the young of ditto; 3, the Moormi Cat, *F. Murmensis*, mihi. Central region only. Mature male.

* Since ascertained to be a new species of M. auropunctata, mihi. Gold-tipped Mongoose.

Plate VII.—The Arna, *Bos Arna*, mas. The Taraï and Bhaver.

Plate VIII.—*Gulo Orientalis.* Lower hills of Nipal. Fig. 1, the fore, and 2, the hind, foot.

Plate IX.—Sculls. 1-1, the Sayer; 2-2, the Machabba; 3-3, the Mul Sampra, or *Martes Hardwickii*; 4-4, Oriental Glutton; 5-5, the Highland Nyool, or *Mangusta Javanica.*

Plate X.—Lowland Nyool. 1 and 2, the head; 3, the ear with hair reflected; 4, fore foot, and 5, hind ditto; 6-7, head of Highland Nyool; 8, its ear; 9, its fore, and 10, its hind, foot; 11, 12, 13, 14, scull of Lowland Nyool.

Part 4th.

Plate I.—The Phusro Jarai of the Nipalese. *Cervus Aristotelis* of SMITH, mature males, and head of ditto. Figs. 1 and 2, from one specimen, and 3 and 4, from another.

Plate II. fig. 1, scull of *Ailurus Fulgens*; 2, upper teeth of ditto; 3, lower teeth of ditto; 4, scull of short-tailed Manis; 5 and 6, upper, and 7, lower, jaw of ditto; all nat. size.

Plate III.—The Lokriah Squirrel, *S. Lokriah*, mihi. Central region of Nipal. Nat. size.

Plate IV. fig. 1, common Musk Shrew of Nipal. *Sorex Indicus?* 2, common field mouse of Nipal; 3, Sano Chuah, or lesser common rat of Nipal. *M. Ratus.* Black rat? All natural size. Fig. 4, the scull; and 5, the hand, of the Shrew.

Plate V.—The Nipalese cat. *Felis Nipalensis*, mature male; 2, head of ditto.

Plate VI.—Black and white flying Squirrel. *Sciuropterus* Alboniger, mihi. Central and northern regions. Fig. 1, the fore foot, and 2, the hind. Nat. size.

Plate VII.—Ghoral Antelope. Figs. 1 and 2, head of mature male, 3; head of young male: 4, scull and horns of male; 5, the fore, and 6, the hind, foot.

Plate VIII.—The Buansu, or wild dog of the Nipalese. *Canis primævus*, mihi; fig. 2, reclining figure of ditto.

Plate IX.—Comparative views, on an uniform scale, of the Buansu, Indian jackal, and Indian fox.

Plate X.—Head of the Buansu, nat. size; fig. 2, small front view of ditto.

Plate XI.—Sculls of Buansu, Indian jackal, and Indian fox. Figs. 4 and 5, scull and teeth of Buansu of nat. size.

Part 5th.

Plate I. fig. 1, scull and horns of the Bara Sinha, or Indian type of the true Stag. Inhabits the Bhaver and saul forest of Nipal. Fig. 2, horns of the Chittra, or spotted Axis; fig. 3, horns of Laghuna or Pada or Porcine Axis. Two latter inhabit the Taraï. All three on an uniform scale.

Plate II. figs. 1, 2, 3, various specimens of the horns of the Phusro Jaraï of the Nipalese. *C. Aristotelis* of SMITH. *Hipehaphus* of DU VAUCEL; 4, horns of the Rato Jaraï; 5, horns of the Kalo Jaraï; 6, horns of the Bahraiya, *Cervus Bahraiya*, mihi. (The Maha of the western portion of these hills.) All the animals inhabit the saul forest and Bhaver of Nipal.

Plate III.—Young males of the two varieties of the musk proper to the Kachar region of Nipal.

Plate IV.—Female of the Nipalese variety of Felis Serval. Head of the same.

Plate V.—Head of the Machabba, or Malva of the Taraï. *Paradoxurus Bondar?* mature male. (N. B. Long hair moulted off.) Fig. 2, the male organs of genera-

tion with the bald secreting surface on either side the sheath of the penis; 3, female organs of generation and anus; 4, the fore foot, and 5, the hind foot. (First despatch.)

Plate VI.—Pteropus of central region: *Pt. Lencocephalus*, mihi. ½ of nat. size, (11 inches by 4-8; body and muzzle, uniform saturate brown; whole head and shoulders, rufous yellow.)

Plate VII. figs. 1 and 2, *Rhinolphi*, and 3, *Vespertilio*, of central region. Nat. size.

Plate VIII. fig. 1, *Pteropus;* 2 and 3, *Vespertiliones*, of central region. Nat. size.

Plate IX.—Heads and sculls of the *Vespertilionidæ* of the three preceding plates.

Plate X.—Head and members of the Langoor monkey of the central region.

Part 6th.

Plate I.—The Chikara or Chouka, *A. Tetracornis*. Figs. 1 and 2, horns of nat. size. Habitat Taraï; mature male.

Plate II.—Snakes of central region. (N. B. All of them are innocuous.)

Plate III.—Young Porcupine of central region.

Plate IV.—Tibetan Mastiff, two varieties.

Plate V.—Common Hare of central region. Figs. 2 and 3, Locusts of same region.

Plate VI.—Common Otter of Taraï.

Plate VII. fig. 1, common Toad, and 2, common Frog, of central region.

Plate VIII.—Panther and Leopard of central region. Mature males.

Plate IX.—Cabool grey-hound and scull; 3, scull of *Prochilus Labiatus*.

Plate X. fig. 1, *Prochilus Labiatus* of Taraï; 2, *Ursus Tibetanus* of central region of Nipal. Fem, junior.

Part 7th.

Plate I.—Dentition of *Rhinoceros unicornis* of the Taraï.

Plates II. and III.—Fishes of central region.

Plate IV.—Members of the fishes of the two preceding plates.

Plate V.—The Khar Laghuna, or brown Porcine Axis. Fem. Fig. 1, mature; 2, junior, from living animal in 2nd and 3rd year of age.

Plate VI. figs. 1, 2, scull and horns of Yak of Tibet, mature male; 3, 4, 5, scull of *Ursus Tibetanus* of central region, junior; 6, scull of the Lassa Mastiff, old.

N. B. For the clime and physiognomy of the three regions of Nipal, (*i. e.* the Northern, Central, and Southern ones,) see the published Catalogue of the Mammalia.

Plate VII. figs. 1 and 2, Zibet of central region of Nipal: two figures from different specimens; 3, the Urva of central and northern tracts; 4 and 5, fore and hind feet of Urva.

Plate VIII.—Indian Dûmba sheep, mature male; 2, Cabool ditto ditto, ditto.

Plate IX.—The Barwal or domestic sheep of the Kachar of Nipal; fig. 2, the Hoaniah or domestic sheep of Tibet and of the Himálaya. Mature males.

Plate X.—The Wool-bearing Paradoxurus, *Paradoxurus Lanigera*, mihi; nat. size. Habitat the northern region of Nipal.

Plate XI.—The short-tailed Manis of the central region of Nipal. (N. B. Proves to be a new species.)

Plate XII. fig. 1, Chittra or Axis; 2, Jhou Laghuna or spotted Porcine Axis; mature males. The Tarai of Nipal.

(Second despatch.)—*Extra sheets, three.*

Plate I. figs. 1 and 2, scull of Ovis Nahoor, old male; 3-4, ditto of Ovis Banbhera, junior; 5-6, ditto of musk of Kachar; 7-8 ditto, of *Antelope Hodgsonii*, old male; 9-10, ditto of a Cervi Capra.

Plate II.—Head and limbs of *Ovis Nahoor*, old male.

Plate III.—5 sketches of horns of Ratwa Muntjac, (to prove the various forms they are apt to assume.)

Two more extras.

Plate IV.—*Ursus Tibetanus*, male of two years; and head and limbs of ditto; and 3, views of scull and teeth.

Plate V.—*Ant. Tetracornis*, Chikara or Chouka, male head of ditto, separate.

(March, 1835.)—Another extra sheet.

Plate VI.—Capra Jhárál, wild goat of the northern region. Views of head and horns separate.

(The Tehr of the western hills is a variety with nodose horns, and probably identical with H. SMITH's *C. Jemlaïca.)*

(July 1st.)—Extra sheet.

Plate VII. fig. 1, The Arna; 2, Gouri Gáo, mature males. (*Bubalus Arna* and *Bisonus Gavcens.)* Tarai.

Plate VIII. figs. 1, 2, Arna; 3, tame Buffaloe; 4, Yâk; 5, 6, Gáuri Gao. Sculls and heads.

N. B. The delineations of the extra sheets to be substituted for prior drawings of the *same subject.*

XIII.—*Miscellaneous Extracts.*

1.—*Influence of the Moon on the Weather. By* F. MARCET.

[Extracted from Jamieson's Edin. Phil. Journal, 1835.]

On the question whether the moon has any influence on the weather or not, there are two opposite opinions: the great mass of the people, including sailors, boatmen, and most practical farmers, entertain no doubt whatever, of the influence of the moon; whether the change of the weather at the lunar phases will be from fair to foul, or from foul to fair, none of them pretend to decide beforehand, but most of them think, that at the new and full moon, there is generally a change of some kind. On the other hand, philosophers, astronomers, and the learned in general, attribute this opinion altogether to popular prejudice. Finding no reason, in the nature of atmospheric tides, for believing that changes should take place on one day of the lunation, rather than another, they consider the popular opinion to be unsupported by any extended series of correct observations.

In the Annuaire for 1833, ARAGO, the learned editor, has presented the result of the observations of SCHUBLER in Germany, during twenty-eight years, or 348 synodic revolutions of the moon. During this period of 348 new moons, &c. the number of rainy days were as follows:

It rained on the day of the new moon, ...	148	times.
Do.....do.....first quarter,.....	156	do.
Do.....do.....full moon,.....	162	do.
Do.....do.....last quarter,.....	130	do.

The observations of SCHUBLER were made during eight years at Munich, four years at Stuttgard, and sixteen years at Augsburg. As a good meteorological register has been long kept at Geneva, the author thought it would be interesting to ascertain from the tables, (which have been carefully published in the Bibliothèque of that city,) whether, during a period of thirty-four years, viz. from 1800 to 1833, any inferences could be drawn for or against the popular opinion on the subject of lunar influence.

He finds, during these thirty-four years, the number of rainy days and quantity of water fallen, to be as follows:

	Rainy days.	Water fallen.
At the new moon,.....	123	432· lines.
First quarter,.....	122	429·6 ditto.
Full moon,.....	132	415·9 ditto.
Last quarter,.....	128	368·6 ditto.
Throughout the whole period,.....	3,657	968 in. 93 lines.

Thus it appears, that during thirty-four years, or 12,419 days, comprehending 420 synodic revolutions of the moon, there have been 3,657 rainy days. This gives for every 100 days, 29·45 rainy days; and we find, that

For every	100	days of new moon,	29·29	have been	rainy.
Do.	do.	first quarter,	29·05	do.	do.
Do.	do.	full moon,	31·43	do.	do.
Do.	do.	last quarter,	30·48	do.	do.

Hence, it is evident, that during these thirty-four years at Geneva, the days of new moon and the days of the first quarter have been just about as liable to be rainy days as any other common day of the month; while the days of full moon and those of the last quarter have been rather more liable. But although the days of full moon have been rather more frequently wet days than those of the new moon, it does not follow that more water has fallen at full moon, than at the change. The result of observation in that respect is as follows:

For every 100 days of new moon, there fell			102·9	lines.
Do.	do.	first quarter,	do.	102·3 do.
Do.	do.	full moon,	do.	90·0 do.
Do.	do.	last quarter,	do.	89·9 do.

The average quantity for 100 days is 93·6 lines, whence it appears, that at the new moon, the first quarter, and the full moon, more water has fallen than on common days; at the last quarter, less. The quantity fallen on the total of the lunar phases, surpasses that on other days in the proportion of 98 to 93·6. Another question is, whether a change of weather is more liable to happen on the four principal days of the lunar phases than on common days. But it must be first decided, what is meant by the term change of weather.

This term should, the author thinks, be limited to a change from clear weather to rain, or from rain to clear weather, and not be understood to include, as some meteorologists make it, all changes, such as that from calm to windy, or from clear to cloudy, &c. As the author accepts it, the weather must have been steady during two days at least; that is, that the weather has been clear, or that it has rained more or less during two consecutive days. For example, a week has passed without rain; it rains on the eighth day, and on the ninth, the weather is again fine. In this case, according to the author's definition, there is no change of weather.

So also, if it has rained during five successive days, the sixth and seventh must

be clear, in order to constitute a change of weather. This may be arbitrary, but at least it is not vague ; and if practised, it will prevent, in the balancing of calculations, any leaning to a favorite hypothesis. To avoid another error, into which some may have fallen, the author marks no change as occurring on lunar phases, but those which take place on the very day, and never those which may happen on the evening before or on the next day. With these precautions, he finds that, during the thirty-four years, or 12,419 days, there have been 1,458 changes of weather. Of this number, 105 have taken place at the epoch of the two principal lunar phases, viz. 54 at the new moon, and 51 at the full moon. Now the whole number of principal phases during the thirty-four years is 840 ; therefore, as 12419 : 840 :: 1458 : 98·6, the number of changes which would have taken place at new and full moon, had these lunar phases had no more than the share of common days ; but instead of which, the number was 105. Of the 54 changes at new moon, 32 were from rain to fine weather, and 22 from fine weather to rain. Of the 51 at full moon, 31 were from rain to clear, and 20 from clear to rain. Thus at the new and full moon, the changes to fine weather are to those to rain as 63 to 42. Having thus proved, that the epoch of new and full moon are not absolutely without some effect on the weather, the author examined, whether this effect was confined to those very days, or extended to the day following. On the days following the new and full moon, there were 129 changes, instead of 98·6, which would have been the number had these shared the proportion only of common days. With respect to the days of the first and last quarter, the changes on these were 96, which bring them nearly to the condition of common days. It is thus shown from the tables, that the chance of change at the new and full moon, compared with the chance on ordinary days, is as 125 to 117, and that the chance on the day following these two phases, compared with the common days, is as 154 to 117. Upon the whole, therefore, this examination lends some support to the vulgar opinion of the influence of new and full moon, but none whatever to any special influence of the first and third quarters. With respect to the barometrical pressure, it is ascertained, that out of the 1,458 changes of weather, there were in 1,073 cases a corresponding rise or fall of the barometer, according as the change was from rain to fair or the contrary. This is nearly as 3 to 4. Of the 385 false indications of the barometer, 182 were on a change from rain to clear, and 203 on a change from clear to rain. Finally, of the 385 anomalies of the barometer, 17 were at full moon, and 10 only at new moon.

2.—*On the Composition of the Rangoon Petroleum, with Remarks on the Composition of Petroleum and Naphtha in general.* By William Gregory, M. *D. F. R. S. E.*

The author first adverted to the discovery, nearly about the same time, of paraffine by Reichenbach, and of petroline by Dr. Christison. The former occurred among the products of destructive distillation ; the latter was found in the Rangoon petroleum, and they were soon found to be identical. Reichenbach's researches on naphtha were then quoted, by which it appears, that that indefatigable observer could not discover, in the kind of naphtha which he examined, any trace either of paraffine, or of any other product of destructive distillation. On the contrary, he found, naphtha to possess the characters of oil of turpentine, a product of vegetable life ; and he succeeded in obtaining a precisely similar oil from brown coal, by distillation at 212°. The facts had led Reichenbach to

the conclusion that naphtha in general is not a product of destructive distillation, and consequently, must have been separated at a comparatively low temperature.

The author showed, that Dr. CHRISTISON's discovery of paraffine, of which Dr. REICHENBACH was necessarily ignorant, is inconsistent with this view; and detailed some experiments, by which he has rendered highly probable the existence in petroleum of eupion, another of the products of destructive distillation. This substance is a liquid of sp. gr. 0·655, boiling at 110°, and very fragrant. The author obtained from the Rangoon petroleum a liquid of sp. gr. 0·744, boiling at 180°, and rather fragrant.

The oil of turpentine, as is well known, boils at 280°, and has a sp. gr. of 0·860 : so that, at all events, the naphtha from the Rangoon petroleum is not oil of turpentine. This was farther proved by the tests of nitric acid and iodine. Similar experiments on one or two other species of naphtha led to similar results. They all yielded a liquid of sp. gr. about 760, and, consequently could not be oil of turpentine. The kinds of naphtha tried were Persian naphtha, obtained from Dr. THOMPSON, and commercial naphtha, sold by M. ROBIQUET, at Paris.

The author concluded, that if the naphtha examined by REICHENBACH were genuine, there must be two kinds of naphtha; one a product of destructive distillation, the other the oil of turpentine of the pine forests of which our coal-beds are formed, separated by a gentle heat, either before or after their conversion into coal. It is obvious that our common coal-beds have never yet been exposed to a heat sufficient for destructive distillation, since they are destroyed by a moderate heat; and we may therefore expect the petroleum of these coal-beds to be of the kind described by REICHENBACH; while the Rangoon and Persian petroleums, being products of destructive distillation, must have their origin, if in coal-beds at all, in such as have been exposed to a high temperature, and must consequently be very different from the oridinary coal-beds. In confirmation of this view, it may be stated, that Dr. CHRISTISON could find no paraffine either in the petroleum of St. Catherine's or in that of Trinidad or Rochdale.

The author finally directed attention of the application of the paraffine as a material for giving light, as, when pure, it burns with a clear, bright flame, like that of wax, and might doubtless be obtained at a cheap rate in the East.—*Edin. Phil. Journ.* 1835.

[Since the above was in type, we have received a copy of the papers, and a specimen of the paraffine from Mr. G. SWINTON, with a list of queries which we will endeavour hereafter to resolve.—ED.]

3.—*Extracts from Proceedings of Zoological Society of London.*—1834.

August 12.—A collection of *land* and *fresh-water Shells*, formed in the Gangetic Provinces of India by W. H. BENSON, Esq., of the Bengal Civil Service, and presented by that gentleman to the Society, was exhibited. It comprised forty species, and was accompanied by a descriptive list prepared by the donor, and also by detailed notices of some of the more interesting among them. These notices were read: they are intended by Mr. BENSON for publication in the forthcoming No. of the 'Zoological Journal.'

From the time that he first became acquainted with the animal of a *shell* resembling in all respects, except in its superior size, the European *Helix lucida*, Drap., Mr. BENSON regarded it as the type of a new genus of *Helicidæ* intermediate between *Stenopus*, Guild., and *Helicolimax*, Fér. He had prepared a

paper on this genus, for which he intended to propose the name of *Tanychlamys*; he finds, however, that Mr. GRAY has recently described (Lond. and Edin. Phil. Mag., vol. v. p. 379), the same genus under the name of *Nanina*. The generic characters observed by Mr. BENSON are as follows:

NANINA, *Gray*.

Testa *heliciformis, umbilicata; peritremate acuto, non reflexo.*

Animal *cito repens. Corpus reticulosum, elongatum. Pallium amplum, foramine communi magno perforatum, peritrema amplexans; processubus duobus transversè rugosis (quasi articulatis) omni latere mobilibus instructum, unico prope testæ aperturæ angulum superiorem exoriente, altero apud peripheriam testæ. Os anticum inter tentacula inferiora hians; labia radiato-plicata. Tentacula superiora elongata, punctum percipiens tumore oblongo situm gerentia. Penis prægrandis; antrum cervices elongatum latere dextro et prope tentacula situm. Solea complanata pedis latera æquans. Cauda tentaculata; tentaculum subretractile, glandulâ ad basin positâ humorem viscidum (animale attrectato) exsudante.*

Mr. BENSON describes particularly the habits of the species observed by him, which he first discovered living at Banda in Bundelkhand on the prone surface of a rock. The animal carries the shell horizontally, or nearly so; is quick in its motions; and, like *Helicolimax*, it crawls the faster when disturbed, instead of retracting its *tentacula* like the *Snails* in general. In damp weather, it is rarely retracted within its shell, the foot being so much swelled by the absorption of moisture, that if it is suddenly thrown into boiling water, the attempt to withdraw into the shell invariably causes a fracture of the aperture. In dry weather, the foot is retracted, and the aperture is then covered by a whitish false *operculum*, similar to that of other *Helicidæ*. The two elongated processes of the mantle are continually in motion, and exude a liquor which lubricates the shell, supplying, apparently, that fine gloss which is observable in all recent specimens. The fluid poured out from the orifice at the base of the caudal horn-like appendage is of a greenish colour; it exudes when the animal is irritated, and at such times the caudal appendage is directed towards the exciting object in such a manner as to give to the animal a threatening aspect.

Of several specimens brought to England by Mr. BENSON in 1832, one survived from December, 1831, when it was captured in India, until the summer of 1833.

Another *shell* particularly noticed by Mr. BENSON is the type of a new genus, allied to *Cyclostoma*, which he has described under the name of *Pterocyclos* in the first No. of the 'Journal of the Asiatic Society of Calcutta.'

Specimens of a species of *Assiminia*, LEACH, were preserved alive in a glass, replenished occasionally with fresh or salt-water, until after the vessel in which Mr. BENSON returned to England had passed St. Helena.

A *Snail*, obtained near Sicrigali, and the river Jellinghy, one of the mouths of the Ganges, is characterized by Mr. BENSON as HELIX *interrupta*.

In the character of the excrement being voided from an opening in the terminal and posterior part of the foot, instead of from the *foramen commune*, the animal of *Hel. interrupta* differs most materially from the other *Helices*. The angulated periphery of the shell shows an approach to *Carocolla*; but Mr. BENSON is not aware that the animal of this genus differs from that of *Helix*. From *Hel.*

Himalayana, LEA, the *Hel. interrupta* is distinguished by its peculiar sculpture; its spire is also more exserted.

The collection also contained specimens of an *Arcaceous Shell* found in the bed of the Jumna at Hamírpur in Bandelkhand. Mr. BENSON proposes for it the generic appellation *Scaphula*.

Referring to specimens contained in the collection of a new form of *Solenaceous Shell*, described by him in the 'Journal of the Asiatic Society of Calcutta,' under the name of *Novaculina*, Mr. BENSON describes also a second species of the genus which he has recently obtained from South America, and points out the characters which distinguish it from *Nov. Gangetica*.

The following Note by Mr. BENSON, relative to the importation of the living *Cerithium Telescopium*, BRUG., adverted to at the Meeting on March 25, 1834, (vol. v. p. 145,) was read.

"The possibility of importing from other countries, and especially from the warmer latitudes, the animals which construct the innumerable testaceous productions that adorn our cabinets and museums, the accurate knowledge of which is so necessary, to enable the conchologist rightly to arrange this beautiful department of nature, must be an interesting subject to every naturalist, and will render no apology necessary for the following notices extracted from my journal. Their publicity may incite others who may have opportunities of trying the experiment, to follow the example.

"January, 1832. Observed near the banks of the canal leading from the eastern suburb of Calcutta to the Salt Lake at Balliaghát, heaps of a *Cardita*, with longitudinal ribs, of a large and thick *Cyrina*, and of *Erithium Telescopium*, exposed to the heat of the sun, for the purpose of effecting the death and decay of the included animals, previously to the reduction of the shells into lime.

"Early in the month I took specimens of them, and leaving them for a night in fresh water, I was surprised to find two *Cerithia* alive. I kept them during a fortnight in fresh water, and on the 22nd January, carried them, packed up in cotton, on board a vessel bound for England. After we had been several days at sea, I placed them in a large open glass, with salt water, in which they appeared unusually lively. I kept them thus, changing the water at intervals, until the 29th May, when we reached the English Channel. I then packed them up, as before, in a box, and carried them from Portsmouth to Cornwall, and thence to Dublin, which I did not reach until the 14th June; here they again got fresh supplies of sea-water at intervals. One of them died during a temporary absence, between the 30th June and 7th July; and on the 11th July, the survivor was again committed to its prison, and was taken to Cornwall, and thence to London, where it was delivered alive to Mr. G. B. SOWERBY on the 23rd July.

"This animal had thus travelled, during a period of six months, over a vast extent of the surface of the globe, and had for a considerable portion of that time been unavoidably deprived of its native element."—W. H. B.

4.—*Minerals of the Trappean Rocks of Bombay.*

The following list of the minerals which occur in the volcanic rocks of the several islands in the harbour of Bombay is extracted from a paper by Dr. R. D. THOMSON in the '*Records of General Science*,' *for April*, 1835.

1. Basalt of Salsette: dark-grey or blackish, with numerous crystals of olivine and augite interspersed.

2. Black basalt of Elephanta, presenting a homogeneous aspect when fractured, but frequently containing minute portions of olivine, sometimes in rounded granules, at others crystallized: texture highly indurated. This and the other variety fuse before the blowpipe per se into a mass resembling pitchstone. The celebrated figure of the elephant, close to Galliputi, consists of this rock, but it appears to be of limited extent.

3. Amygdaloid, appearing at the great temple of Elephanta, possesses a hard wacke basis, containing cavities filled with rock crystal and zeolites, &c. The rock has a purplish aspect, and is evidently decaying in many situations, by the readiness with which the atmospherical influences act by the medium of the amygdaloidal cavities. Before the blowpipe this rock simulates fused basalt.

4. Yellowish gray claystone porphyry, at the lower cave of Elephanta. The predominating particles have a yellow resinous appearance, with a black basis.

5. Green claystone porphyry, appearing at Babula Tank: fine ground, and admitting of a good polish, interspersed with dark-coloured soft particles, which have an even fracture, and appear to be small masses of indurated clay.

6. Amygdaloid, with a light-coloured porphyritic basis and green cavities, accompanied generally with large crystals of calcareous spar from the neighbourhood of Parell. The calc-spar is sometimes dark-coloured, probably from the effect of reflected light.

7. Numerous large fragments of shell conglomerates may be observed on the shore of Elephanta, consisting of a nucleus of porphyry, or amygdaloid, closely surrounded by adhering bivalves, which afford means of extending the limits of the growth of the mangrove.

The amygdaloidal cavities contain numerous species of various classes of minerals, of which under the genus *silica* may be enumerated, 1, rock crystal, termed *palanca* in the Malabar language, and *spadika* in the *Grantham* dialect; 2, quartz; 3, milk and rose do.; 4, calcedony; 5, amethyst; 6, agate; 7, cornelian; 8, oriental jasper, or bloodstone, rare at Bombay, but abundant in Gujerát and Cambay.

Of the alkaline class are; 1, calcareous spar; 2, mesolite, whose composition (by THOMAS) is expressed by the formula $3\,\mathrm{Al.\,S} + (\frac{1}{3}\,\mathrm{C} + \frac{1}{2}\,\mathrm{N})\,\mathrm{S}^3 + 3\frac{1}{4}\,aq.$

3. Heulandite, in Caranja and Elephanta, in large white crystals.

Of the cornelians a beautiful variety is brought to Bombay, containing elegant arborizations resembling the ramifications of inclosed mosses, a phenomenon which in many instances appears to be justly attributable to such a cause. The remark of PLINY, "Infestantur plurimis vitiis—aliis capillamentum rimæ simile*," with regard to rock crystal, refers to the presence of titanite. The same naturalist observes of rock crystal, "Oriens et bene multis, sed Indicæ nulla præfertur†," which is ignorantly denied by GARCIAS ab orto, who was for several years viceroy of India. He says, "nullo autem ex prædictis loco crystallus invenitur quemadmodum nec per universam Indiam‡."

The bloodstone, or oriental jasper, appears to be imported from Gujerát. It is characterized by presenting a greenish appearance, with numerous blood-red streaks or veins, traversing it in various directions. It is to the latter species, or to the mock pearls so frequently employed as ornaments by the inferior castes, that we are to refer the expression of the historian of ALEXANDER "lapilli ex auribus pendent§." But with regard to the "gemmas margaritasque mare litoribus infundit," it is not easy to give a satisfactory explanation, although the latter obviously relate to the pearls of the Indian Seas.

* Hist. Nat. Lib. xxxvii. c. 2. † xxxvii. 2. ‡ Hist. Arom. i. c171. 171.

§ Quint. Curt. i. 8. c. 9.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of September, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Ags. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Ags. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	29,591	28,418	1,173	82,6	2,3	2,4	98,	,484	,310	1,174	84,3	4,1	3,0	97,	75,3	94,8	1,00	NE.	se.	se.	clear.	overcast.	drizzle.
2	,711	,540	,171	83,7	3,4	3,6	96,	,607	,356	,251	85,9	5,6	5,8	91,	76,0	102,2		SE.	sw.	s.	cumuli.	fine.	fine.
3	,669	,496	,173	84,7	3,7	3,8	95,	,597	,297	,306	86,3	5,4	5,7	91,	77,0	119,5		o.	w.	sw.	fine.	do	fair.
4	,645	,347	,297	86,1	4,1	4,3	97,	,463	,176	,287	87,5	4,3	4,0	96,	80,4	125,4	0,10	NW.	sw.	nw.	clear.	cum. str.	threatning.
5	,660	,426	,234	85,9	4,8	5,2	93,	,556	,247	,309	88,2	6,3	8,0	7,	77,5	103,1		E.	se.	se.	cumuli.	do	fine.
6	,775			83,5	6,1			,700			82,2	4,6			76,2	88,9		E.	ese.	o.	strati.	cumuli.	rain.
7	,733	,543	,190	85,0	5,6	5,0	93,	,627	,448	,179	84,9	4,2	3,9	96,	75,0	95,2	0, 35	E.	se.	se.	fine.	do	dull.
8	,709	,551	,158	84,1	5,2	4,1	95,	,590	,336	,254	86,7	6,3	5,6	92.	77,0	109,6		S.	sw.	sw.	cir. cum.	cloudy.	cumuli.
9	,696	,497	,199	85,2	4,6	4,3	95,	,569	,373	,196	85,2	5,7	5,1	93,	79,1	107,5		S.	sw.	sw.	do	do	dull.
10	,708	,484	,224	85,3	5,2	5,0	93,	,583	,260	,323	88,0	8,2	7,6	89,	77,8	112,2		s.	sw.	sw.	fine.	cumuli.	cum. str.
11	,724	,482	,242	86,4	6,1	6,2	91,	,605	,280	,325	88,6	10,1	9,6	83,	77,8	113,0		o.	se.	se.	do	fine.	fine.
12	,720	,447	,273	87,4	7,0	6,8	89,	,606	,270	,336	89,4	10,2	9,3	84,	77,5	118,0		o.	ne.	N. E.	clear.	do	do
13	,709			85,1	7,5			,578			88,0	14,7			76,1	122,2		n.	N.	n.	do	do	nimbus.
14	,611	,319	,292	83,3	6,2	6,1	91,	,508	,162	,336	89,4	8,1	7,8	88,	80,0	119,5		n.	ne.	o.	cum. str.	dull.	showery.
15	,663			83,4	6,6			,552			82,5	5,6			78,4	91,5	0,40	NE.	NE.	ne.	sett. rain.	storm.	storm.
16	,491	,347	,144	83,4	3,4	3,3	98,	,440	,392	,048	82,0	3,0	3,1	98,	74,5	76,1	4,00	N.	NE.	ne.	do	overcast.	drizzle.
17	,696	,606	,090	81,7	2,6	3,0	99,	,610	,484	,126	83,6	3,0	2,9	98,	72,1	85,0		S.	sw.	sw.	cum. cir.	fine.	cloudy.
18	,769	,735	,034	81,3	4,4	3,8	96,	,632	,485	,147	84,0	4,9	4,4	95,	75,4	101,2	0,24	W.	sw.	se.	do	do	hazy.
19	,722	,583	,139	83,5	4,2	3,8	96,	,594	,412	,182	84,7	4,6	4,6	94,	75,6	99,3		o.	sw.	sw.	sett. rain.	rain.	fine.
20	,739			79,8	2,5			,634			82,2	6,4			72,3	89,8		o.	s.	o.	scud.	cumuli.	cloudy.
21	,714	,589	,125	82,7	3,0	3,0	98,	,594	,438	,156	84,1	3,6	2,8	94,	75,2	98,2	0,44	e.	ne.	e.	heavy rain.	do	rain.
22	,658	,536	,122	83,1	3,7	4,2	94,	,544	,434	,110	83,4	3,8	2,5	99,	74,0	102,1	0,30	E.	e.	e.	rain.	rain.	overcast.
23	,653	,600	,053	82,2	2,7	2,7	99,	,560	,484	,076	82,2	3,6	2,7	100,	74,0	81,4	0,85	E.	se.	se.	cumuli.	cloudy.	drizzle.
24	,713	,596	,117	82,3	3,3	2,6	100,	,608	,523	,085	82,0	3,3	3,0	95,	73,5	82,0	0,74	ese.	se.	se.	gale.	rain.	cloudy.
25	,742	,647	,095	82,5	3,6	2,6	97,	,663	,628	,035	81,1	2,5	2,7	98,	73,5	80,0	0,30	S.	se.	se.	rain.	do	cum. rain.
26	,724			81,0	5,5			,699			80,0	4,1			74,2	85.0	0,12	S.	s.	sw.	clear.	clear.	clear.
27	,752			80,0	8,6			,647			83,7	13,0			75,2	107,1		s.	sw.	W.	cloudy.	cumuli.	fine.
28	,762			82,3	5,8			,679			85,8	11,2			77.0	109,8		sw.	sw.	w.	fine.	fine.	clear.
29	,810			83,2	6,0			,710			86,8	11,4			73.5	113,5		S.	s.	w.	clear.	clear.	do
30	,804			84,6	7,8			,746			87,0	19,9			78,5	121,5		s.	o.	n w.			
Mean,	29,702	28,514	1,169	83,7	4,8	4,1	95,	,599	,371	1,201	85,0	6,8	5,0	93,	76.0	101,8	9,34	changeable.			showery, seasonable.		

A slight leak having been discovered in the pluviometer hitherto registered, the rain has this month been inserted from the Surveyor General's register, merely putting each entry back one day to correspond with the actual time of fall. The rain for three months past should be also increased nearly one-fourth, viz. June, 12·71, July, 18·12, August, 12·12; or 13·92, 19·66, and 13·10, if the *lower reservoir* be preferred.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 46.—October, 1835.

1.—*Report on some Inscriptions found at Hammam, on the Southern Coast of Arabia,* 1835. *By Messrs.* T. G. HUTTON, *Asst. Surgeon, and Lieut.* J. SMITH, *of the Palinurus Surveying Vessel.*

[Communicated to the Asiatic Society by the Government of Bombay. See Proceedings, 2nd Sept.]

March 14th, 1835.—The accompanying inscriptions were found in the neighbourhood of *Dís,* a Bedouin town, a few hours distance from *Ras Sharma,* on the southern coast of Arabia.

The natives who came off to the ship represented it as a populous, well-cultivated district, abounding in vegetables and fruits of various descriptions. Having learned from these persons that there were a number of ancient buildings, and some writing in a character unknown to the Arabs, we naturally felt an inclination to make a personal inspection of them; and to effect this with security, Captain HAINES sent our pilot, a native of the place, on shore, to request the Ruling Sheikh to grant us his firman, and a few Bedouin attendants. In reply, a letter was sent off, making a most exorbitant demand of money, rice, copper, and sundry other very useful articles, specifying the individual quantities with much nicety and precision, as a price of his protection. This of course was politely declined; and from a subsequent conversation with some of the party themselves, they appeared not only to regret the exercise of their cupidity, which had deprived them of at least a few presents from the ship, but seemed to be sensibly ashamed of a conduct so much at variance with the hospitable treatment we had universally met with since leaving Maculla.

We left *Sharma* without remarking any thing further than the remains of two water tanks, much resembling in form and structure, those we saw on the summit of *Hasan Ghorâb*. There appeared also to have been a fort and a small town on the point of the cape; but time had been so active in her work of destruction, that the traces merely were visible. At *Gossyrh*, we were more fortunate, and although the distance was greatly increased, it was deemed desirable to obtain some correct information of a part of the country, which in all human probability may never be visited again under such favourable circumstances, and which promised to prove so interesting in an antiquarian point of view. With the permission of Captain HAINES, Mr. SMITH and myself started from *Gossyrh*, and after a tedious journey of about 15 miles, through a flat, barren country, we halted for the night about 10 P. M. under the ruins of a very old fort. Here we slept, and the following morning commenced our researches. The Bedouins, who attended us, unfortunately knew nothing of either the ruins or the writing; but having recalled to our recollection the name of a Bedouin, who had been on board for medical assistance at *Sharma*, we inquired for his residence, which he had informed us was in the neighbourhood, and found him exceeding civil and obliging in showing us every thing he considered might be of interest to us. Like all his Arab brethren, he knew nothing but what his own external senses had taught him; and in common with them, he adopted the easy method of accounting for forts, tanks, inscriptions, &c. by ascribing them all to the superior genius of the Feringís, of whom they seem to have entertained a kind of superstitious dread: of course little else than the names of the places could be procured. The fort is called *Hasan el Meimelí*, and from its size, the nature of the materials of which it is composed, and its form, appears never to have been remarkable for its strength or stability. It is now completely in ruins. After traversing great part of the neighbouring country, which is known by the name of Hammam, we at last came to *Jibul Aaledma*, where we were directed to look for the inscriptions.

About half way up the hill, which we estimated about 200 feet, we came to a spacious cave, on the sides of which, wherever a smooth surface presented itself, we discovered the traces of writing. Most of it was executed in a species of red paint, but in one or two parts, a black composition had been made use of; by the ravages of time, many of them were nearly obliterated; but in others, by wetting the surface, and removing the dust which had accumulated, the characters became much more legible, and in one part in particular, the colour became quite brilliant, looking as fresh as though it had been just laid on.

Having discovered and copied those very perfect inscriptions of *Hasan Ghorâb*, we were at once struck with the resemblance they bore to these now before us, and on a more minute comparison, the letters will be found generally to correspond, although there are a few here, which do not present themselves in the former. As it would appear, that the style of writing is now extinct, at least entirely so in this part of Arabia, it becomes a pleasing subject of speculation by what persons they could have been executed. The characters certainly bear a stronger assimilation to the Ethiopic than to any other known in the present day; and consulting the history of Arabia, we find, that prior to the Persian conquest of *Yemen*, under NOUSHIRVAN, the whole of that fertile province was under the sway of the Abyssinians, many of whom having become enamoured of its beauties, permanently settled here. I think such are fair grounds for assuming that these are the remains of that people, especially as we know them to have been an enterprising commercial nation, with talent and qualifications, which fitted them for such design as *Hasan Ghorâb*, from the execution of which the native inhabitants would have shrunk with despair. For a solution of these difficult questions, however, it will be more becoming in us to preserve silence, and leave them to the disposal of persons better qualified by their peculiar studies and more extended information on such points. I may here mention the coincidence of the name *Hasan Ghorâb*, and *Bait Ghorâb*, the fort and house of *Ghorâb*, which latter is one of the most populous and powerful tribes in the neighbourhood of *Hammam*. On questioning one of the tribes concerning the origin of his title, he told us, his ancestors came from *Hasan Ghorâb*, a place, however, only known to him by hearsay. There are now many intermediate tribes between the two places, so that should the information be correct, we may infer that this is merely a branch of the family drawn here by the comparatively fertile nature of the soil over that about *Hasan Ghorâb*.

With respect to the general features of the country about *Hammam*, it wears a most unpromising aspect, there being to all appearance nothing but barren hills; but on entering the ravines and valleys, the scene becomes suddenly changed, and the eye is once more gratified by the visible marks of cultivation and the industry of man. In each corner of the valley may be seen a thriving date grove, and sometimes pretty large portions of grounds, covered with Taam, onions, garlic, sweet potatoes, and a variety of melons and pompions, one species of which is called the "Bortugal," for what reason it would not appear very evident. The Nebek and cocoanut thrive well. After searching about for further curiosities, we left *Hammam* about noon, and instead of

returning direct to *Gossyrh*, we chose a path nearer to the distant range of *Assad*, and after much fatigue, and some little risk, we arrived at the old fort of *Maaba*, about 12 o'clock at night. We were led to make this deviation in consequence of the character we received of the fort from the natives, who informed us, it was composed entirely of hewn stone, and in a high state of preservation; a distant hope too of finding further inscriptions prompted us to visit the place.

In our search for inscriptions, we were disappointed, neither could we learn from the people about, that there existed any. This, however, should not damp a person's ardour in quest of antiquities, as many of the Arabs positively cannot recognize writing when they see it, if it differ at all from the modern Arabic. We saw an instance of this at *Hammam*; having accidentally found a few characters engraved on a stone on the road side, we immediately stopped to take a copy, while the Bedouins anxiously inquired, "why we were writing the stone," as they simply expressed it; and on being informed that we were copying the writing upon the stone, they seemed half incredulous about it. A short time after this, one of them took me to look at a stone on which he said there was some writing; it proved, however, to be nothing but some natural marks on the surface of the rock, and when I told him this, he laughed, and candidly told me he knew no better.

The fort of Maaba, to all appearance, has been strong and well constructed, of stones and mortar; though the former are not hewn, as we were informed they were. There are no embrasures for guns, but numerous loop-holes for muskets or matchlocks. The plan of the building seems good for defence, and its position admirably chosen on a rising ground, in the point of convergence of three fertile valleys well cultivated and thickly planted with date groves. It was said, this was one of the castles that defended the market road to *Hadramaut*, where are many others of a similar description. The road still passes under its dilapidated walls. From hence to *Gossyrh* is about five or six miles.

April 1st, 1835.—In prosecuting the survey of the coast, we again heard of some inscriptions about 40 miles to the eastward of *Hammam*. Lieut. Sanders, Mr. Smith, and myself, with the concurrence of Captain Haines, started off for the purpose of copying them, after having previously examined the ruins of *Hasan Mesánáh*, situated close to the beach, on a gentle insulated eminence. The foundation wall is now all that remains, the stones of which have evidently been hewn, and strongly cemented with mortar. Every thing around bears striking testimony of its antiquity. It has originally served for the protection of a village, the position of which

Inscriptions near Dís on the South Coast of Arabia.

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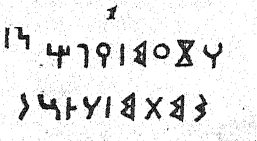

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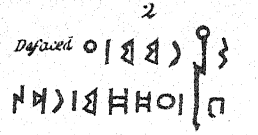

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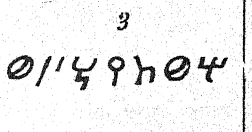

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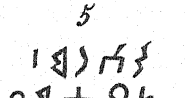

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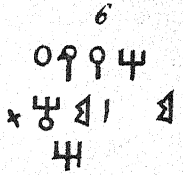

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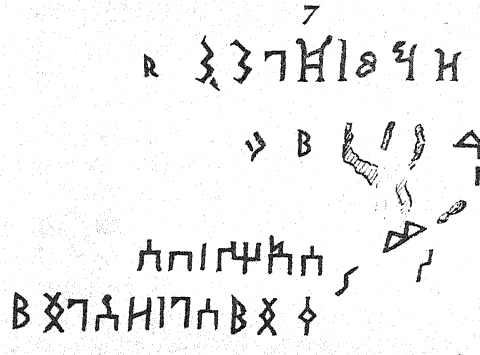

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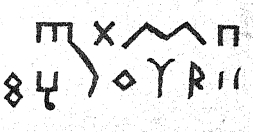

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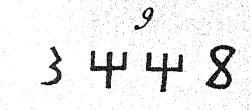

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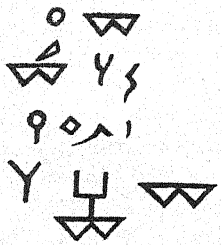

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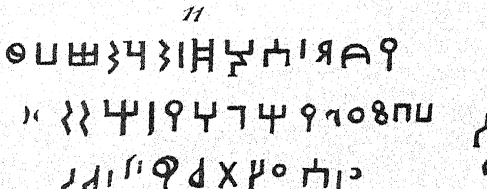

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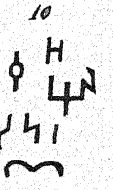

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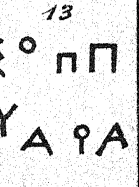

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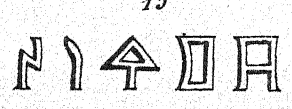

The Astrophysics

Inscriptions E of Hammam on the coast of Arabia.

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Bibliotheca Regia

can now be inferred only, from the loose dark nature of the soil, and a few small fragments of glass and copper, scattered here and there, so common a circumstance in most of the ancient towns on the Arabian coast.

A walk of about 12 miles brought us on to *Nakhul Mayuk*, a very small date grove, at the foot of the lofty range of mountains a little to the eastward of *Wady Shulkhowi*. Here we began to ascend, and having attained an elevation of about 1500 feet, we came to a spacious cave, in a part of which we found the adjoining characters, written exactly in the same manner with red paint as those at *Hammam*. Immediately underneath is said to have been a well, more probably a small reservoir for water, from its position and the dryness of the soil. It is now filled up with loose stones and rubbish. The surrounding country, with the exception of one or two very small date groves, pressing out from some obscure corner of a valley, is one unvaried scene of barrenness and desolation. We were told, however, that after a fall of rain, the scanty herbage which springs up was a sufficient inducement for the Bedouins to bring their flocks up to the hills, and during which time, they inhabited this and any other caves which they found convenient.

Having slept here for the night, under the protection of a few Bedouins of the Menahil tribe, we started early the following morning, to return by the same dreary path which conducted us on our pilgrimage.

II.—*Account of Súngie Ujong, one of the States in the interior of Malacca. By Ensign* T. J. Newbold, *23rd Regt. Madras Light Infantry.*

[Read at the Meeting of the 5th August.]

[The following information, touching the population, customs, amount of produce, boundaries, &c. of the states described, has been principally and necessarily derived from the natives themselves. It is therefore offered with diffidence; but, at the same time, it is to observe here, that fully alive to the disadvantages of such sources, no labor has been spared by me to check and render by collation and patient investigation, such information now submitted, as correct and near the truth as possible.]

The states in the interior, formerly under general sway of the princes deputed from Menangkabowe, are under the immediate government of their respective *Panghúlús* and *Súkús*. As each state has its peculiar features, it would seem advisable to give them a separate notice. By Malays, the precedence is ascribed to Súngie Ujong; the *Panghúlú* of which territory is addressed, by his brethren, by the

appellation of *Abang*, elder brother; the second place is given to Rúmbowe, and the third to Johole. Srimenánti, whose claims still remain unsettled, aspires to the fourth place.

Boundaries.—Súngie Ujong is situated towards the source of the right branch of the Lingie river. It is bounded to the north by Jellabú; to the south, by part of Rumbowe and the Lingie river; to the east, by Srimenánti, and to the west, by Salangore. Its boundaries with Jellabú are said to be Búkit Tángoh and Dhúlúkáru bander Barangan; with Rumbowe, Búkit Angin, part of the right branch of the Lingie river, and Parentian Tingih; with Srimenánti, part of Teráchi and the Páro stream: and with Salangore or Calang, by the river Lángkat, Kobak Kámbang, and Tongal Sejága.

Population.—The population in 1832, was estimated at 3,200 Malays, principally Menangkabowes; and 400 Chinese employed in the mines. Many of the latter have since fled to Malacca, in consequence of the disturbances in 1833. The principal villages are Lingie, (the residence of the *Dattu Múda*, Kátas;) Pantei, (the residence of the *Panghúlú*;) Jíboi, Sála, Linsom, Durian, Tanjong, Rassah, Kopaiyong, Rantou, Síliou, and Jirrah. The Teráchi territory, a portion of which appertained to Súngie Ujong, now claims independance.

Trade.—The trade of Súngie Ujong is principally in tin, which is got at Sála, Sa Máraboh, Battu Lobong, Kayu Arra, and Tímiong. Thence it is brought down to Lingie, and landed at Pankálangs, Cúndang, Durian, and Mangis. It is here deposited in ware-houses, and generally bartered for rice, opium, salt, tobacco, cloths, oil, and shells for making lime, brought up by boats, from ½ to 1½ coyans burthen, which cannot easily ascend higher than this part of the river.

The tin is conveyed by Malay coolies, by land, from the mines, as far as Jíbói; a village estimated at 30 miles from Lingie; and thence to Lingie, by small boats, down the river.

From the following extracts from treaties made by the Dutch, it would appear that they did not neglect to avail themselves of this source to increase the revenue of Malacca.

Article I. of a treaty concluded by the Dutch Governor W. Boelan in Council, with the chiefs of Rumbowe and Calang, dated Malacca, 24th January, 1760.

"The tin being the produce of Lingie, Rumbowe, and Calang, without any exception, will be delivered to the Company at 38 drs. a bhar of 3 piculs; and this price will always continue, without its ever being enhanced; it will be in the power of the Company to seize and confiscate, and to appropriate for their use, all tin which might be

discovered to have been fraudulently exported from the places above-mentioned."

A profit equal to about 18,000 Spanish dollars is supposed to have accrued to the Dutch annually from this monopoly; which so rigid were they in enforcing, that we find it stipulated in the same treaty, "that no boats or vessels, to whomsoever they may belong, shall be allowed to pass the Company's settlement at Lingie without touching, in order that a search may be made in such boats or vessels for tin; any person attempting to evade these rules, will be liable to have their boats, and the tin which may be found in them, confiscated and sold, and the proceeds appropriated for the use of the Company and the said chiefs." Also, that "no boats or vessels of any description whatever be permitted to proceed from the north to south, or passing from the latter to the former part, or passing the straits of Malacca, without being provided with a pass, on pain of being seized."

During the British Government at Malacca, from 1795 to 1818, the trade fell into the hands of private individuals, principally Dutch and Chinese merchants residing at Malacca. In 1819, the Dutch resumed the monopoly, as we find from the 7th article of a treaty, dated Naning, the 5th day of June, 1819, between the Supreme Government of Netherlands India and Raja ALI, the *Panghúlú* and *Ampát Súkú* of Rumbowe, which runs thus: "Raja ALÍ, the *Panghúlú* and *Ampát Súkú* of Rumbowe, must give up to Government all the tin from Lingie, Súngie Ujong, Rumbowe, and any place under their authority, without reservation. The Government binds itself to pay 40 Spanish dollars per bhar of 300 catties, or 370 lbs., &c."

On the resumption of Malacca by the English, in 1825, the tin trade relapsed into the hands of the private merchants.

Miners.—In 1828, the number of Chinese miners amounted to nearly 1000 men, who were regularly divided into nine *Kongsis* or companies, each under its respective *Tao-kae.* They were chiefly of that singular fraternity, the *Tian Tay Huay,* or Triad Society, whose mysterious oaths and secret laws appear to be not very dissimilar from those which bound the Carbonari of Modern Europe. Jealousy of their fast increasing power and numbers, or some alleged offence, but more probably the treasure amassed by this brotherhood, (whose property was in common,) led in 1828, to their massacre by the Malays.

In 1830, the mines were again worked by about 400 Chinese, who went up, at the inducement of some Malacca merchants, and continued there until the late disturbances in 1833, when many of them returned to Malacca. The mines at present are but partially worked, and very

little of the tin passes down the river, in consequence of the feud existing between the Rumbowe chiefs and those of Súngie Ujong and Lingie.

The Malays and Chinese employed in the mines were liberally paid. The rate of their wages will shew the difference of value set upon the services of the two classes;—a Chinese being paid at the rate of 5 to 8 dollars per mensem; and a Malay from 3 to 5 only.

From day-break to 7 A. M., they are employed in clearing the mines from the water which accumulates during the night. From 7 to 8, they rest and breakfast. At 8, the process of digging out the earth and ore is commenced. At 11, they go to dinner, and return to work again about 1 P. M.

At 5, their labours cease for the day. No work is done at the periods of new and full moon.

Like their Cornish brethren, the Malay miners are very superstitious. They believe in the existence of a spirit *(Kummang)*, who watches over the mines, and whose wrath they are particularly careful not to provoke by work or deed. They have "wise men," or *Puwángs*, who pretend to be able to ascertain the most favorable spots for sinking a mine, by various spells and charms; these may be compared with the charlatanic wielders of the *virgula divinitoria* in our own "enlightened country."

Previous to a description of the mines, a short outline of the principal geological features of the peninsula, as far as present imperfect information extends, may not wholly be out of place.

The southern part of the Malayan peninsula and Banca assimilate in geological formation. Dr. Horsfield, in his observations on the mineralogical constitution of Banca, observes, that "the direction of the island being from north-west to south-west, it follows not only the direction of Sumatra and the Malayan peninsula, but the large chain of Asiatic mountains, one of the many branches of which terminates in Ceylon, while another traversing Arracan, Pegu, the Malayan peninsula, and probably Sumatra, sends off an inferior range through Banca and Billiton, where it may be considered to disappear."

This chain of mountains may be considered as the termination of one of those beams or pillars of lofty hills, spoken of by M. de Guignes, in his work on the Huns, as supporting the stupendous edifice, to which he compares the elevated regions of Tartary, comprehending the lofty ranges of *Imaüs* and *Caucasus*; and the dome of which is represented as one prodigious mountain, to which the Chinese give the epithet of *celestial*, down the steeps of which numerous broad and rapid rivers pour their waters.

The Malayan range, as far as has been hitherto explored, is of primitive formation; principally grey stanniferous granite.

In the gold countries of Tringánu, Pahang, Gominchi, and Mount Ophir, rocks and crystals of quartz are met with. At the southern extremity, and in some parts of Salangore, porphyry occurs.

The islands in the neighbourhood of Malacca, and those off the eastern extremity of the Salangore coast, consist principally of granite and laterite with sienite.

According to Dr. WARD, "The small hills in the neighbourhood of Malacca are formed of a conglomerate, the base of which is clay iron stone, containing imbedded portions of felspar, in a state of decomposition (having all the properties of yellow ochre), and small grains of quartz and iron glance, scattered through its substance.

"The specific gravity of the rock is 2·536; when recently dug, it is soft, can be easily cut, and readily stains the fingers; but after exposure to the air for some time, it acquires such a degree of hardness as to be broken with difficulty: and its durability is shewn by the present state of the ancient buildings, which have stood unimpaired for nearly 300 years.

"In its dry state, it is porous, from the destruction of the ochreous particles by moisture and exposure to the air, resembling old lava in its external appearance.

"In all its properties, it agrees exactly with the rock common on the Malabar Coast, and described by Dr. BUCHANAN under the name of laterite."

The mountains at Penang are also "composed of fine grey granite, and all the smaller eminences are of the same material." "Some of the small hills near the coast are partly formed of the laterite already described when speaking of Malacca; and Saddle island, at the south-western angle of Penang, is apparently entirely composed of the same ingredient."

At the Carimons, hornstone is found. Mr. MARTIN states, the aspect of the Island of Singapore, (situate on the southern extremity of the peninsula, in Lat. 1° 17′ 22″ north, and Long. 103° 51′ 5″ east,) to be "low and level, with an extensive chain of saline and fresh water marshes; in several parts covered with lofty timber and luxuriant vegetation, here and there low rounded sand-hills interspersed with spots of level ground, formed of a ferruginous clay, with a sandy substratum. The principal rock is red sandstone, which changes in some parts to a breccia or conglomerate, containing large fragments and crystals of quartz. The whole contiguous group of isles, about thirty in number, as well as Singapore, are apparently of a submarine

origin, and their evulsion probably is of no very distant date." It may be added, that bouldered pieces of primitive trap are found on the shores of Singapore, though none has hitherto been seen in *sitú*.

The range of mountains on the peninsula, as it approaches the equator, diminishes in height. The highest of the Rumbowe and Johor ranges, (with the exception of Mount Ophir,) not exceeding, probably, 3000 feet; while many of those to the north of Kedah are said to be upwards of 6000.

Mount Ophir, a detached mountain, between 30 and 40 miles to the eastward of Malacca, I calculated roughly (by means of the thermometer and boiling water) to be 5693 feet above the level of the sea; its summit is granite. Gold dust and crystals of quartz are found in considerable quantities around its base*.

From information hitherto collected, and inquiries made among the natives, it would not appear that any volcanoes exist in the interior; though the circumstance of numerous hot-springs, scattered over the face of the country, and other indications, sufficiently testify the presence of subterraneous fires. Severe shocks of earthquakes have been felt from time to time, but whether caused by violent eruptions from any of the volcanoes on the opposite coast of Sumatra, or by under-ground explosions there, or in the peninsula itself, is uncertain.

There are hot-springs in the vicinity of Malacca; at Ayerpánnas, and also near Sabáng, and at Lúndi in the Naning territory. I have visited the two former places, and found the temperature of the water at noon of the springs at Ayerpánnas, to be 120° Fahrenheit, and at 6 A. M., 113½°.

The temperature of the hot-springs at Sabáng was found at 6 A. M. to be 110° Fahrenheit. The variation in the former instance is accounted for by the different temperatures of atmosphere at the time of taking the heat. The heat of the springs in both cases, I found to exceed that of the atmosphere by an average of 35° Fahrenheit, in several comparative trials.

At the wells near Sabáng, when the bulb of the thermometer was pushed into the soft vegetable mould at the bottom of the spring, the mercury rose to 130°.

The springs at both places are situated in swampy flats, environed by small hills. They average from 1 to 2½ feet in depth, and are discernible from a distance by the steam and odour that escapes. The water is of a pale bluish green tinge; from the bottom bubbles of air (probably sulphuretted hydrogen) ever and anon find their way to the surface, where they burst.

* See J. A. S. vol. ii. page 497.

Dr. WARD analysed a portion of the water from the springs at Ayerpánnas, and found, that on slow evaporation in a sand-bath, 1000 grains of the water left a residuum of eight grains of saline matter, principally muriate of soda, with a slightly bitter taste, indicating the presence of sulphate of magnesia.

The surface of the peninsula is covered generally by alluvial deposites, rich in ore of tin, and not unfrequently mixed with gold; over this lies a layer of vegetable mould, in which stones or pebbles are seldom found.

In the interior, the land is mountainous, but undulating towards its coasts, shaded by primæval forests, and stored with treasures to the botanist and naturalist; it is almost devoid of plains. The strips of low ground lying in the hollows of the undulations are almost invariably swampy, and are converted into *Sawahs*, or wet rice-grounds, by the natives.

At various places along its western coast are low cliffs, if they may so be termed, of a reddish steatite.

The banks of the most considerable rivers are generally low, swampy, and covered with mangrove, *Nipah*, *Nibong*, and other trees of the same nature.

The bottom is for the most part of mud, except at short distances from the estuaries, where sand banks and coral reefs are often met with.

The tin of the peninsula, and the eastern islands, (particularly those of Junk Ceylon, Lingga, and Banca, which may be styled the eastern Cassiterides,) is diffused over a great geographical extent.

Mr. CRAWFURD observes, that "tin, wherever found, has a limited geographical distribution; but where it does exist, it is always in great abundance. The tin of the Indian Islands has, however, a much wider range of distribution than that of any other country, being found in considerable quantity from the 98° to the 107° of east longitude, and from the 8° north to 3° south latitude."

It has, however, been since stated by Mr. ANDERSON, that tin has been found in considerable quantities much farther north, viz. in the interior of Tavoy, in latitude 12° 40′ north; the mines are situated at a place called Sakána, about four days' journey from the city of Tavoy.

It has been affirmed, that tin exists so high as 14° north, in Siam.

The peninsula of the present day, although auriferous, appears not to deserve its appellation of "The Golden Chersonesus," so much as its neighbour, the Island of Sumatra, to which, by the way, there is a tradition, mentioned by the early Portuguese historians, that it was formerly united. Sumatra, by some, has been supposed to be the

Taprobána of the ancient geographers; this Mr. Marsden denies, ascribing rather the name to Ceylon, the *Serendib* of Muhammedan writers, and the *Lanca* of the Hindus; and affirms, that Sumatra was unknown to them, denouncing the descriptions given by Strabo, Pomponius, Mela, Pliny, and Ptolemy, as obscure and contradictory.

Admitting the tradition to be based on truth, it might be conjectured, that the Peninsula and Sumatra, thus united, formed that tract of country known to the Greeks and Romans by the title of "*Aurea Chersonesus.*" This might serve in some measure to explain why so extensive an island, and one so rich in gold and spices, the two great desiderata of ancient, and I may venture to surmise, modern days, should have escaped the notice of ancient geographers.

The quantity of gold dust exported annually from the south-west coast of Sumatra and Achin alone, according to Marsden and Hamilton, amounts to 26,400 oz. The former states, that there are no fewer than twelve hundred gold mines in the dominions of Menangkabowe alone; a considerable portion of the produce of which (perhaps one-half) never comes into the hands of Europeans.

The gold of the peninsula, on a rough estimate, amounts to 19,800 oz. annually. It is chiefly got at Ulú Pahang, Tringánu, Calántan, Johole, Gominchi, and Jeleye; Reccan, Battang, Moring, and other places at the foot of Mount Ophir.

A small quantity of iron is found in the interior of Quedah, in the peninsula, and also in Sumatra. Siam and Billiton produce this metal in tolerable abundance.

I do not find that silver is produced in any part of the peninsula; although Perak, from its name, which signifies silver, and which is conjectured by Marsden to have been the Αργυσα of Ptolemy, might have been supposed to have derived its appellation from the presence of this metal.

The tin produced annually in the peninsula, including the adjacent Island of Junk Ceylon, is estimated at 34,600 peculs.

According to Crawfurd, the tin of Banca, produce of 1817, amounted to 35,000 peculs, or 2,083½ tons.

Tin Mines.—The mines are generally excavated on the swampy flats at the base of hills of primitive formation. They average from six to twenty feet in depth, following the streams of ore *(Húlúr bíjí)*, which will sometimes run in a horizontal direction to the distance of three miles, according to the nature of the ground. These excavations are termed *Lombongan*. The streams vary in diameter from six inches to eighteen and twenty, and consist of a quantity of small heavy granulated portions of a dark hue, and shining with a metallic

lustre, intermixed with a glittering white sand. The excavations made by the Malays, are more superficial than those dug by the Chinese, as they are too lazy to work the streams, which lie deep.

The strata under which the ore is found are commonly, 1st, a black vegetable mould; 2nd, red clay; 3rd, white clay, with white pebbles, apparently decomposed quartz, and 4th, a bed of shining white sand, called *Passír bíjí*. Under the ore lies a stratum of steatite, called *Nápal*, or a hard bed of decomposed rock. The native term for the tin ore is *Bíjí tímah*, literally seeds of tin; when melted, it has the name of *Tímah masak*. Crystals of quartz and fragments of micaceous schist are sometimes found among the alluvial earth thrown out.

The soil is carried out by the miners in baskets, suspended at the extremities of a stout elastic bambú or *penága*, which passes across the shoulders. The men are divided into two parties, which work in regular succession, one entering the shaft with emptied baskets, while the other makes its egress, with the filled ones. At Ulu Pondoi, in Naning, and at Jerram Kambing, I am informed, the mines are natural caverns in the rock. The Malays and *Jacoons* collect the ore by the light of dammer torches.

The ore is taken to a stream, conducted by artificial channels, lined with the bark of trees, to the vicinity of the mines, and stirred about with an iron rake, or a *choncole*. The water carries off the sand, small pebbles, and earth, leaving the ore and large stones at the bottom, which are afterwards separated by a riddle and the hand. The ore, thus cleared of extraneous substances, is deposited in the *koppos*, to await the process of smelting.

Smelting or Melanchúr.—The smeltings are carried on at stated periods, twice or thrice a year, according to the quantity of ore collected, and always at night, to avoid the great heat.

The ore and charcoal, (of the *Kompas*, *Kamoui*, or other hard woods,) are gradually heaped up, in alternate layers, in a rude furnace of clay, called a *Bullowe*, with an aperture below, to allow the escape of the fused metal. The fire is urged, and the whole mass brought into a glow by a sort of leathern bellows called *Hambúsan*, and sometimes by ruder ones, constructed like an air-pump, and made from the hollowed trunk of a strait tree, with a piston, headed by thick folds of paper. These are called *Kalúbongs*.

The Malays for the most part content themselves with the *Tropong*, which is merely a hollow bambú converted into a sort of blow-pipe, and worked by the mouth.

As the heat increases, the melted metal is received into a hole dug in the ground, called the *Telága*, or reservoir; and thence, with the assistance of iron ladles, poured into the moulds.

The tin now assumes the shape of the ingots of commerce, of which there are two kinds common in Súngie Ujong, viz. the *Támpang* and *Kepping* or *Bangka*. The former weighs from half a catty to two catties, and the latter, from fifty to sixty catties; one catty is equal to one pound and three-quarters.

The *Támpang* is generally used by the Malays.

In the furnaces used by the Chinese, 800 *lbs.* of metal may be produced during the course of a night. Those of the Malays seldom produce more than one-sixth of this quantity.

From 100 parts of the ore, it is calculated, from 65 to 77 of pure metal are produced. The ore of Banca yields 58. That of Junk Ceylon, according to an assay made by Mr. Blake, 64½.

The water is drained from the mines, if shallow, by means of a channel, leading into a neighbouring stream; but if deep, the *Putáram Ayer* is had recourse to. This hydraulic machine is, I believe, of Chinese invention. The Rev. Mr. Tomlin, a zealous missionary, gives the following description of it:

"The apparatus is simple, consisting of a common water wheel, a circular wooden chain about 40 feet in circumference, and a long square box, or trough, through which it runs in ascending. The wheel and chain, I think, revolve on a common axis, so that the motion of the former necessarily puts the latter into action. The chain consists of square wooden floats, a foot distant from each other, and strung as it were upon a continuous flexible axis, having a moveable joint between each pair.

"As the float-boards of the chain successively enter the lower part of the box or trough, (immersed in water,) a portion of water is constantly forced up by each, and discharged at the top. At one of the mines we were much struck with the simple but efficient mode of its application. There were three distinct planes or terraces rising above each other. On the middle one was the wheel; the lower was the pit of the mine; from the higher a stream of water fell and turned the wheel, which, putting the whole machine into motion, brought up another stream from the pit; these two streams, from above and below, uniting on the middle plane, run off in a sluice, by which the ore was washed."

Regarding the smelting of tin, in a recent number of Dr. Lardner's Cabinet Cyclopædia, (No. 54, pp. 21 and 22,) are the following remarks on the advantages of pit coal over charcoal: "Authorities are not agreed as to the time when pit coal first began to be substituted in the reverberatory smelting houses (of Cornwall) for wood or charcoal, though this is generally supposed to have been about 1680.

" In the smelting of this (tin), as of other metals, the application of this fuel has been productive of immense advantages; and such is the perfection to which our metallurgic operations have been carried since the economical introduction of this cheap and plentiful fuel, that the regulations of our custom-house alone prevented the carrying a scheme set on foot some years ago, for the importing of the tin ore from the eastern mines, for the purpose of being smelted in this country, and afterwards re-exported."

It would appear to have escaped the observation of the author of this article, that the enormous forests which thickly cover the whole of the Malayan peninsula, and the Island of Banca, under the very shade of which the miners may be said to work, furnish on the spot a cheaper and more economical fuel than the coal pits of Newcastle or Whitehaven do to the miners of Cornwall, at the sole expence of the labor of felling them; setting aside the loss of time, the expence of importation and exportation, and disinclination of the natives to such a scheme. Moreover, according to Mr. CRAWFURD, the cost of producing a cwt. of Banca tin is but 22*s*. 8*d*., whereas that of Cornwall amounts to 64*s*. 7*d*. The cost of producing a cwt. of the metal in Súngie Ujong is estimated by an intelligent native at 23*s*. The immense natural obstacles in Cornwall, only to be surmounted by the most powerful steam engines, and the unremitting application of all the means human ingenuity can devise, together with the high price of labor, are, however, the principal causes in the enhancement of the cost of production in England.

The time perhaps is not far distant when like ingenuity and similar means will be applied to the unlocking of the hitherto partially developed resources of the East.

According to the best native information, the annual produce of the peninsula, before the late disturbances in the tin countries, was as follows:

Places.	*Peculs.*
Súngie Ujong,	7,000
Perak,	7,500
Quedah,	600
Junk Ceylon,	1,500
Pungah,	1,500
Salangore, Calang, and Langkat,	2,000
Lúkút,	1,600
States in the interior of Malacca,	900
Pahang,	1,000
Kemaman and Tringano,	7,000
Calantan,	3,000
Patani,	1,000
	34,600

The discovery of tin in the peninsula cannot be traced, but it is assuredly of ancient date. Part of Perak is said to be the *Temála*, or land of tin, of Ptolemy, and *Cálang*, (a name signifying tin in Malay,) to be the *Malaiou Colon* of the same author, and the *Malaya-Culam* of the Hindus.

The tin mines of Banca are of modern origin, being accidentally discovered, Mr. Marsden tells us, in 1710, by the burning of a house; the trade of the peninsula suffered considerably in consequence.

According to Mr. Crawfurd, (as before stated,) the tin of Banca, produce of 1817, amounted to 35,000 peculs, or 2083$\frac{1}{2}$ tons, equal to half the produce of England. But under the management of the Dutch, I am informed, it now scarcely produces half that quantity.

The price of Banca tin is from 16 to 16$\frac{1}{2}$ dollars per pecul = 133$\frac{1}{3}$ lbs., and of Straits tin, (chiefly from the peninsula,) from 14$\frac{1}{2}$ to 15. British block tin, in 1832, was selling at £3 12*s.* 6*d.* per cwt.

In consequence of a supposed adulteration of Straits' tin, some specimens of ingots of this metal, rejected at Canton, were sent from Singapore to be assayed at Calcutta in 1831. This was done at the Calcutta assay office, which pronounced the specimens to be of good quality, and perfectly good in a mercantile sense. "Great Britain, (according to Dr. Lardner's work already quoted,) notwithstanding the productiveness of her own mines, imports upwards of 700 tons per annum of oriental, or, as it is more commonly called, Banca tin, from the name of one of the Malay islands, where it is chiefly obtained. The Malay countries are reckoned the richest depositaries of this metal in the world; and from them, China, Hindostan, and many European markets are chiefly supplied. England exports annually about 2,000 tons of tin, including 400 or 500 tons of that received from abroad." Her produce varies from 3 to upwards of 4000 tons annually.

Revenue.—Besides the *Kapála dágang*, and other sources of revenue previously mentioned, as enjoyed in common by the *Panghúlú Delantye* of the interior states, the *Panghúlú* or *Klána* of Súngie Ujong, and the *Rája adhi Rája* have the privilege of purchasing, at every smelting, from each *bongsal*, three *bhars*, equal to nine peculs, or nine hundred catties of tin, at six dollars per *bhar* less than the market price, and exact a duty of six dollars a month for each mine dug on their own lands.

The *Dattu Múda* of Lingie levies also a dollar per *bhar*, on tin passing down the river.

The *Kapála dágang* is a sort of poll tax on slaves imported into

* See Gleanings in Science, Vol. III.

the interior, from four to six dollars per head; they are generally *Battaks* from the vicinity of Battu Bára, on the opposite coast of Sumatra, and average twenty annually. They fetch a price from 20 to 60 dollars each; according to age, condition, and sex; a higher value being set on the females.

In addition to these imposts, the chiefs of Súngie Ujong formerly enjoyed the division of a premium paid annually by the Chinese and other merchants of Malacca for the tin monopoly, amounting, it is said, to 2500 dollars; 1000 of which went to the *Dattu Múda*, and 100 each to the three elders of Lingie; 800 to the *Klána* of Súngie Ujong, and the remaining 400 to the *Rája adhi Rája*.

The deputed Menangkabowe prince, it is affirmed by the Rumbowe people, had the right of levying a duty, at Sempong, on the Lingie river, of two dollars per *bhar*, on tin passing that settlement from Súngie Ujong, which was afterwards given up as a subsistence to their *Iang de pertúan Múdas*. In consequence of the disavowal of this claim by the Súngie Ujong and Lingie chiefs, and other causes too long for detail, a war ensued in 1833, and a consequent blockade of the river by the *Iang de pertúan Múda*, SAYED SAABAN, at Sempong, still existing, and by which the trade of Súngie Ujong has suffered very materially.

Government.—Súngie Ujong was ruled, under the *Iang de pertúan Besár*, by a *Panghálú*, three *Súkús*, and a *Rája adhi Rája*. The *Panghálú*, as has been already remarked, owes his title, *Klána Putra*, to one of the kings of Johor. He now refuses to acknowledge the control of the *Iang de pertúan Besár*.

BANDAHÁRA SEKUDAI is supposed to be the first chief invested with this title; and regarding his origin, a long tradition was related to me by the present *Rája adhi Rája*, the abstract of which amounts to this, viz. "In ancient times, one of the princesses of Súngie Ujong having had the presumption to laugh at the naked state of a *Batin* of the Jacoons, incurred his resentment, and was forcibly compelled to follow him through thicket and brake, until moved with compassion, this *sans culotte maître de danse* broke the spell and married her.

"The offspring of this sylvan union is said to be SEKUDAI: from whom descend the *Panghálús* of Súngie Ujong."

In all popular traditions of rude nations, there is more or less of truth to be gathered; and in absence of written and other historical evidence, such testimony ought not to be entirely neglected, and set aside as valueless; though frequently ridiculous, and mingled up with matter known to be incredible and void of truth. We need not instance here the works of the early poets of Greece and Rome.

It is certain, that to this day, in Súngie Ujong, Johole, and Jompole, the twelve *Batins*, or chiefs of the savage tribes, have a considerable share in the election of the *Panghúlús* of these states, though there is not now apparent any permanent mark of connexion, either social or religious, between the Malays and these aborigines.

As *Káfirs* and infidels they are despised by the Malays, but superstitiously dreaded. Converts are made to *Islám*; but slavery, as far as my observation extends, is their lot.

A few years ago, the late *Panghúlú* of Súngie Ujong, *Klána* Leher, died, leaving two nephews, Kawal and Bhair. It is an ancient custom prevailing in the interior, and, I believe, generally throughout Malayan nations, that when a chief dies, his successor must be elected on the spot, and previous to the interment of the corpse, (which is not, unfrequently, protracted through the observance of this usage to a considerable length of time,) otherwise the election does not hold good*.

The following are the traditional lines, or *Serápa*, in which this custom has been handed down in Súngie Ujong.

سرا فا	*Serápa.*
عمون فند يق لغكهن فنجغ	Amar-nia pendék langkah-nia panjang
سدة سمفي كهند ق الله	Súdah Sampei Kahándak Allah
هند ق بر قبور دتانه ميره	Hándak berqabúr ditannah mérah
سهاري هيلغ سهاري برتانم	Sa-hári hílang, Sa-hári bertánnam,
سهاري بر تمبوة سهاري فليهرا	Sa-hári ber-tamboh, Sa-hári palihará.

Short has been his life, though long his stride!
When the will of God has arrived,
The grave shall be dug in the red earth:
In one-day lost, in one-day planted,
In one-day sprung up, in one-day cherished.

Now it happened that Kawal was absent at the time of *Panghúlú* Leher's death. The three *Súkús* and one of the twelve *Batins* took advantage of Bhair's being on the spot, elected him, and buried the body of the deceased chief. Against this proceeding, the *Rája adhí Rája*, and the remainder of the elective body, the eleven *Batins*, protested; a war ensued, which terminated in 1828, pretty much as it began. Kawal, however, by virtue of the suffrages of eleven out of the twelve *Batins*, and by the support of the *Rája adhí Rája*, is generally considered the legitimate chief.

* In consequence of this custom, the present Sultán of Johor's younger brother was elected during the absence of the elder brother, whose claims were subsequently acknowledged by the British.

He resides at Pantoi, a village on the left bank of the Lingie river, about 40 miles from the village of Lingie. I had an interview with him at the latter place in 1833.

His features are regular and pleasing; but their expression conveys an idea of indecision and imbecility, probably increased by the immoderate use of opium, to which he was formerly much addicted; the whole tenor of his conversation and manner evinced plainly how completely he was in the leading strings of his adviser, the wily KAÁTAS, the *Dattu Múda* of Lingie, who accompanied him.

His dress manifested a disposition to finery, consisting of a gaudy red *báju*, or surcoat, flowered with yellow; a broad crimson sash thrown round his waist, suspending several weapons of Malayan fashion; a *Battik* handkerchief, with the bicornute tie, and a plaid silk *sárong*, resembling the tartan worn by the Highlanders, descending to his knees; underneath the plaid he wore short embroidered trowsers.

In the left-hand slash of his close vest of purple broad cloth, which was lined with light-green silk, and adorned with silk lace and small round buttons of gold filigree, lay a watch of an antique shape, to which were appended a gold chain and seals. He wore his hair long, and it was very palpable to two of the five senses that he, like DEMOSTHENES in the composition of his orations, had not spared the oil in the arrangement of his tresses.

Rája adhí Rája.—Next to the *Panghúlú* ranks the *Rája adhí Rája*. The jurisdiction of this officer is confined to the river, and its navigation. The office and title, as would appear from the inscription on the seal, were renewed or granted to his ancestors by MUHAMMED JALIL, Sultán of Johore, A. H. 1211. (A. D. 1796-7)

The present *Rája adhí Rája* is a young man, of an extremely prepossessing address and person.

Súkús.—There are only three *Súkús* in Súngie Ujong. The *Rája adhí Rája* may be perhaps considered as occupying the place of a fourth *Súkú* in councils.

The functions of the *Súkús* are similar to those already described, as possessed by the former *Ampat Súkú* of Naning*. Their titles are *Dattu Mantri Jumahad*, *Dattu Mendalika*, and *Dattu Maharája Inda*. The tribes, of which they are the heads, are those of Sa Melongang, Bodoanda, and Tannah Dattar.

Lingie.—The village of Lingie proper, in contradistinction to the settlement of Qualla Lingie, which is within the Company's territory, at the mouth of the river, is a dependency of Súngie Ujong.

It is situated high up the right branch of the river, and consisted,

* See page 298 of the present volume.—ED.

in 1832, when I visited the place, of a straggling collection of upwards of 100 houses. The *Pankálangs* of Pemátang, Passir, Cúndang, Dúrian, and Mángis, may be styled the wharfs of this little entrepôt, for the produce of the Súngie Ujong mines, and the articles brought up for barter. Many of the houses have been pillaged and burnt in the subsequent disturbances.

The establishment of Lingie is of recent date. Between 50 and 60 years ago, six individuals, subjects of Rumbowe, (but originally from Rhio,) removed from Rumbowe to a place on the Malacca coast, between Tanjong Kling and Qualla Lingie, called Kubu Achi, (the fort of Achin;) where, according to local tradition, the Achinese erected a work during one of their expeditions against the Sultán of Malacca. Be that as it may, they had commenced the clearing of the jungle, when one of their number was crushed on the spot by the fall of a tree.

This his companions regarded as a supernatural prohibition to settling there, and quitting the place, passed up the river to the present spot; where, with the permission of the Súngie Ujong chief, they finally established themselves. Their names were Haman, Mahmud, Jahiuddin, Lubbye, Juman, and Kádir Ali.

Haman was appointed head of the little colony, by the title of *Dattu Múda*, and his four companions, as elders. Of these only one now survives Mahmud, who is a hale old man of 70.

Haman was succeeded by his son-in-law the present *Dattu Múda* Mahomed Aátas, more commonly called Kaátas; and the three deceased elders, by Háji Cásim, Háji Muhammed, and Inchi Salihuddin. This last chief was killed in the disturbances at the close of 1833.

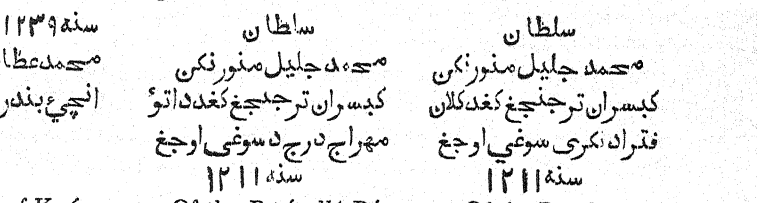
Kaátas, the leading character in Súngie Ujong, is a bony, muscular personage in the prime of life; tall in stature for a Malay, and of erect carriage.

His features are harsh and decided; his dress plain and simple. In character, he is selfish, crafty, persevering, and gifted with some foresight; a quality by no means common among Malays.

He possesses unbounded influence over the weak and sensual *Klúna*; and it is said that his ambition extends to the undivided sway of Súngie Ujong, and the monopoly of the duties on tin. The opposition of the Rumbowe chiefs, with whom he is at present at deadly feud, and the Malay popular antipathy to innovation and deviation from ancient usage, or as they term it, the "*Addat Zeman Dhúlú*," the "*Addat Dattu Nenek*," &c. will prove considerable obstacles in the attainment of his wishes.

KAÁTAS has, on various occasions, evinced an inimical disposition to the English government.

The following are copies of the inscriptions on the seals of the present *Panghúlú* and *Rája adhí Rája* of Súngie Ujong, and of the *Dattu Múda* of Lingie.



Seal of KAÁTAS. Of the *Rájá adhí Rája.* Of the *Panghúlú.*

From the dates and inscriptions on these seals, it would appear that the two first were originally granted, or more probably, renewed to their possessors, by Sultán MUHAMMED JALIL of Johor, in 1211 A. H.

The last is of still more modern date (1239), and merely bears the date, name, and assumed title *(Inchi Bander)* of KAÁTAS.

III.—*Journal of an attempted Ascent of the river Min, to visit the Tea Plantations of the Fuh-kin Province of China. By* G. J. GORDON, *Esq. Secretary Tea Committee.*

May 6th.—Anchored in the evening in the Min river, a short way below a narrow passage, guarded on each side by a fort, and hence named by Europeans, the Bogue, as resembling the entrance to the inner river of Canton. We immediately hoisted out our boat, and prepared every thing for setting out, as soon as the return of the flood, which we expected would be about midnight, would enable us to do so. We determined on trying the western branch of the Min, as laid down in DU HALDE's Map of the province of Fuh-kín. We took with us one copy of a petition, for permission to import rice, on the same footing of exemption from charges as is granted at Canton, and grounded upon the unusual drought of the regular season for planting rice. Another duplicate we left with Captain MCKAY of the "Governor Findlay," to be presented by him to any Mandarin who might come on board to urge the departure of the vessel from the river. As the subject of the petition would require reference to Pekin, we calculated, that sufficient time would thus be gained to enable us to accomplish our object. The copy in our own possession would be resorted to only in case of our being intercepted. The delay in its delivery might be attributed to the altered appearance of

the country in consequence of some rain having already fallen, which made it doubtful whether the prospects of the season were so bad as to render the present a favorable occasion for such an application on our part, founded as it was on the assumption that the country was threatened with famine. Captain McKay was requested to be in no hurry about presenting his copy, but to let all persons understand that he had come with such a petition.

May 7th. At 1 A. M. we left the ship with a fair wind and flood-tide. We were 14 persons in all; namely, Mr. Gutzlaff, Mr. Stevens, and myself, the Gunner of the "Findlay," a native of Trieste, a tindal, eight lascars of various nations, Bengal, Goa, Muscat, Macao, and Malayan Islands, and my Portuguese servant, a native of Bombay. Having studied such charts of the river as we possessed, we resolved on turning to the left as soon as we came to the entrance of a river called in them the Chang: its position corresponding with that of the rejunction of the right branch of the Min, as laid down in the Jesuit's Map. Mr. Stevens kept the look out at the head of the boat, and the Gunner steered, while the tindal sounded. The night was fortunately clear, and by 4 o'clock, we struck off into the western river. This soon widened into a very broad channel, which a little further on seemed to branch into two. That to the left-hand appeared full of shoals, and low sedgy islands, and we accordingly followed that to the right, which appeared still broad and clear. It was on our right, besides, that we had to look for the main stream of the Min. We had not proceeded far before the expanded sheet of water we were proceeding by gradually diminished in width, sending off several small branches in various directions, until at last it dwindled away into a narrow nullah, over which there was a stone bridge. Relying on the strength with which the tide flowed up this creek, as proof that it must lead into some other channel, we struck our masts, and passed the bridge, going on, till we saw reason to believe the reports of the villagers, that there was really no passage into the Min by that course. We accordingly came to, that our people might cook, intending to retrace our way with the assistance of the ebb. Unfortunately, however, the depth decreased so rapidly, that before we had proceeded far, we were fairly brought up, and obliged to wait for the return of the flood. Mr. Stevens and Mr. Gutzlaff went ashore to reconnoitre, and satisfied themselves that the branch we had avoided in the morning, was the proper one to be pursued; in which opinion they were confirmed by the villagers. We were unable to get a pilot. To all inquiries as to our destination we replied that we wished to go to Min-Tsing, the next Hín town above Fuhchow.

We bought a few supplies, but had a copper basin stolen while we were aground. The flood began to make at $5\frac{1}{2}$ P. M., but it was $8\frac{1}{2}$ before we got into the right channel. For two hours nothing could be more flattering than appearances; but suddenly the water began to shoal, and we were obliged to come to anchor.

At day light of the 8th, we found ourselves surrounded by sand-banks in all directions, without any visible channel by which we might advance when the tide should rise. One man agreed to pilot us into the Min for five dollars, and then left us. A second agreed for two, taking one dollar in advance, and after accompanying us a short way, made off. At $\frac{1}{2}$ past 9 A. M., Mr. GUTZLAFF landed with the view of engaging some one to show us the way, when all at once a Kwanfou with a gilt knob said he would be happy to be of any use to us; and as the wind was contrary, would assist by towing us with his own boat. Mr. GUTZLAFF accepted his offer. The man appeared to be of the rank of a subaltern officer; such a proffer coming from such a quarter was of a very ambiguous character. He was probably sent to watch our motions, and took this method of defeating our object. We had, however, no alternative; our attempts to engage a pilot had failed, and we had found from experience, that without some guide, we could not advance. Besides, we could cast off from our professed friend as soon as we should see grounds for alarm. In fact, he led us back towards the mouth of the Chang river, and when he came close to a small hill fort, which we had observed the preceding morning, went ashore. We cast off immediately, and went into the Fuh-chow branch, where, after running up a little way, we anchored for the night. A cold drizzling rain made our situation not very comfortable, and what was more, we found ourselves about two in the morning in danger of canting over into deep water, from the fall of the tide, leaving the boat's keel deeply fixed in the mud of a sloping bank.

May 9th.—The tide favoring us at 7 A. M., we got under weigh, followed by a Government boat, and with a rattling breeze, soon reached Fuh-chow-foo. When near the bridge, we anchored, and struck our masts, and then shot through one of the openings with great ease. There were about a score of soldiers drawn up in arms at the bridge, and after we had passed through, four boats with soldiers put off after us. Mr. GUTZLAFF told the people on board, that if they came alongside when we came to an anchor, we would communicate with them. They continued to follow us at a little distance. Soon afterwards we came in sight of a second bridge, when we feared we should have been obliged to dismast; on approaching it, however, we

perceived that the road-way, connecting the piers, had fallen in at two places, through both of which boats under sail were able to pass. We selected what appeared to be the widest, and got safely through; but Mr. Stevens observed, that the stones, which had fallen in, were but a trifle below the surface, and narrowed the passage so as to leave very little to spare beyond the width of our boat. We were now so far ahead of the war boats, that a fisherman ventured alongside to sell us fish. At ½ past 11 A. M., we came to anchor, that the people might refresh themselves; and the tide having turned against us, we remained at anchor till 4 in the evening. The war boats, in the mean time, came up, and a civil enquiry was brought from one of them as to what nation we belonged, whither we were bound, and with what object. Mr. Gutzlaff, in reply, stated, that we wished to ascend the river, to see tea plants growing, to talk with tea merchants, and to ramble amongst the hills. No objection was made, but that the river was rapid and dangerous. When we weighed, however, these war boats weighed also, and after we had come to at night, they came up and took their station near us. We weighed early on the morning of the 10th, the drizzling rain still continuing, and the thermometer at 57°; but having no boats in sight, to serve for our guidance, we thought it better to come to anchor again, and let the people have breakfast; as we weighed, the war boats weighed, and when we again anchored, they too came to an anchor. Before we set out the second time, two other war boats came up, which made at first, as if they intended to run foul of us, but showed no other marks of opposition, and we pushed on. I now reminded my friends of my uniform declaration, that I would not attempt to force my way if any actual resistance was offered, and that I even questioned the expediency of proceeding at all, if we were to be continually under the eyes of the government officers. However, as we greatly outsailed them, and might possibly wear out their vigilance, we resolved to persevere. As we advanced, we found that none of the boats going up the river would answer our questions, the people sometimes clapping their hands on their mouths, or answering, that they durst not give us any information. After having got a long way ahead of the war-boats, however, we found the people communicative and friendly. We were told of several rapids on the Min river, which could not be passed without a very strong wind, and of other places where the current was not only violent, but the stream too shallow to float our boat. We had in fact already reached a place, where the stream, swollen by the hill torrents, that conveyed the rain, which had fallen during the last 30 hours, was so rapid, that with a light

breeze, and our oars, we were unable to make any way against it, and were obliged to come to an anchor accordingly.

The war-boats, by dint of pulling and tracking, surmounted the obstacle, and did not come to till they were about a mile or upwards ahead of us. We found the people very kind and friendly; but they were soon checked by the appearance of a Kwanfoo, who came to us in a little Sampan, with some loose papers in his hand. He addressed himself to me, but I answered with truth and nonchalance, that I did not understand him: Mr. GUTZLAFF, who stood by, recommended, that little notice should be taken of him; that all communications with the mandarins should be avoided, if possible; and that the papers which he offered, not being in the form of a letter, or otherwise in an official shape, should not be received. The officer then asked some of the people who were on shore near our boat, whether they knew if any of us could speak Chinese. Pointing to Mr. GUTZLAFF, they said he knew a few words, enough to enable him to ask for fowls, eggs, and ducks, which he wanted to buy; and that he spoke about nothing else. One of them was saying something about his distribution of books; but the Kwanfoo was at that moment laughing heartily at the odd appearance of one of our men, and the remark about the books, which was immediately checked by one of the by-standers, passed unnoticed. He still persevered, rather vociferously, in requiring us to receive his papers; when he was motioned to be off. Our Gunner gave the boat a hearty shove with his foot, which decided the movement of the envoy. After it was dark, the people of the village brought us bambús for pulling, with other supplies. The lull of the wind continuing during the night, we distinctly heard much beating of gongs, firing of arms, and cheering in the quarter where the war boats lay; but at day-break of the 11th, we thought we saw them under weigh in advance. A rather suspicious-looking man came to the shore, with a paper which he wished to deliver. We showed no inclination to receive it, and in attempting to throw it into the boat, tied to a piece of stick, it fell into the water, and was lost. Soon after, a simple looking peasant boy showed another piece of paper, which, from its rude appearance, I thought not likely to have come from the authorities, and therefore received and handed it to Mr. GUTZLAFF. It was an intimation, that multitudes of officers, with an army of 9000 men, were drawn up close by, and that there were many tens of thousands of soldiers further on. This was the first decided threat we had of resistance, and it was so grossly exaggerated, that we attached no other importance to it, than that it intimated decided objection to our further advance.

We had already fully resolved on not having recourse to force, unless it became necessary to resort to it, in order to extricate ourselves, if an attempt were made not merely to drive us back, but to seize our persons; and we now proposed to use every exertion to get as far as possible ahead of the war-boats, engage chairs for our conveyance by some inland route, and send back the boat under the charge of the Gunner.

The day being for the first time clear, we were engaged all the morning in baling out and washing the boat; and in cleaning our weapons, much rusted by the wet weather we had hitherto experienced. A breeze springing up a little after 11 o'clock, we hastened to avail ourselves of it, and all our arms were stowed away as speedily as possible.

We had gone on some way ploughing the stream in beautiful style when all at once shot began to fall about us. We deliberated for a moment what was to be done. We believed that retreat would not save us from further firing, as long as we were within its reach, if we would take the practice of the troops at the Bogue as an example of the general rule of the Chinese in such cases; and if we could get out of the reach of their shot by running ahead, we might have time for negociating. On turning a point, however, the wind failed us, and our enemies pursuing us, the firing became more hot and dangerous than ever. My next idea was to run the boat ashore, and attack the Chinese, but the river was very narrow, and on the opposite bank they had erected a mud breast-work, from which they could fire on us with their small cannon, with full effect; and it would be exceedingly difficult to get at our assailants, on account of the steepness of the bank where they now stood. After receiving a good peppering, we put about; but as I anticipated, they continued to fire upon us: and my servant, with one of the lascars, was wounded, though both slightly, and all of the party had narrow escapes from death. The strength of the current soon carried us beyond their fire, and we were in a fair way of reaching Fuh-chow before day-break of the 12th, when we unfortunately missed our way some time after the top of high-water, at 2 o'clock A. M. At day-break, we found ourselves on high ground, 60 yards from the nearest point of the river. We had nothing for it, therefore, but to wait the return of the tide. Numbers of men, women, and children came about us to sell geese, fowls, and fish. Some amongst the crowd we recognised, as having been amongst those we had seen while attempting the western branch of the river. They noticed the marks of the balls that had passed through the gunwale, or stuck in the sides of

the boat; but this did not seem to make any difference in the friendliness of their demeanour. While we were at breakfast, two boats came up filled with soldiers, who were immediately landed, and one party marched towards our boat, while another was drawn up as a reserve. The officer, who commanded the advance, with several of his men, scrambled into the boat. They were desired by Mr. GUTZLAFF to retire; but not complying, our people were desired to turn them out, which they did accordingly. I collared their officer, and was on the point of tripping up his heels, when he threw himself down, and Mr. GUTZLAFF begging me to leave him to him, I desisted from further violence, though the loud and insolent manner of the man made forbearance not very agreeable. Mr. GUTZLAFF then commenced rating the fellow in such animated language, that he became apparently thunderstruck, having no apology to offer for the rudeness and violence with which he came to execute his commission, which he said was merely to inquire who we were, and what we wanted, and to desire us to be off. Mr. GUTZLAFF informed him that we came to present a petition to the Viceroy, but not having met with an accredited officer, its delivery had been postponed; that we had taken an excursion on the river, in order to see the tea plant; that we had proceeded openly, and avowed our intention without being told; that so innocent an object could never draw on us treatment such as no civilized government would offer to innocent strangers. He then harangued with great energy and effect, on the base, treacherous, cowardly, and barbarous conduct we had experienced on the preceding day, and on our own forbearance in not returning the fire; showing him, that we had plenty of arms, which we had taken for our defence against robbers, and assuring him, that we were not afraid to risk our lives against numbers: but had not come with the intention of making war on the government of the country, and would therefore wait to see whether that government would afford us redress by punishing those villains who had thus without any provocation attempted to take our lives, before having recourse to other means. If justice should be withheld by the provincial government, the case might go before the Emperor, and if punishment were not then inflicted on the guilty, the affair was not likely to end there. Mr. GUTZLAFF's eloquence, with the display of our fire-arms, left the Kwanfoo without a word to say for himself, or for his country. He acknowledged, that we had been shamefully treated; but that he was not of the party, and could not be implicated in their guilt, and promised that we should experience nothing but civility from himself. He received our petition, which he handed to one of

his people to take to his boat, and ordered off the rest of his men. He agreed to assist us in getting off from the field where we lay, and to tow us on our way as far as Mingan—a tower and fort, a short way below the place, where the western branch rejoins the Fuh-chow river. We asked him if there was no way of going down without passing under the bridge of Fuh-chow. He said, there was; and that he would probably take us by that route. We got afloat about 11 A. M., and two or three hours afterwards, recognised our position to be that which we had abandoned in despair four days before. Had we remained where we lay on the 8th, till the flood had made, it would have carried us into the main river, and we should have had one or two days start of the war-boats, or perhaps entirely escaped their observation. The Kwanfoo continued on board, except when relieved by an inferior officer from the towing boat, intending, as we presume, that we should appear to be his prisoners. In the afternoon, the wind became very strong, and the fleet ran in towards a large village, where they proposed anchoring for the day. Finding, however, that the bottom was stony, and that there was already too little water for our boat, we refused to remain, and were preparing to set sail, when the officer, who had brought us on, earnestly requested to be taken into our boat again. We received him on board, and were again taken in tow, the other war boats accompanying. At dusk, they wished to take us to another large village; but we pointed out a more sheltered spot, and they took us there accordingly. The officers still remaining on board, Mr. GUTZLAFF was requested to desire them to withdraw, which they did; and as they had been uniformly civil since morning, I sent each of them a pair of blue printed cotton handkerchiefs. It was settled that we should again get under-weigh with the morning's ebb, and that after reaching Mingan, we should pursue our way to the ship, without further attendance. At 10 o'clock P. M., I was surprised by a letter from Captain McKAY, of that day's date; he stated that he had been importuned in the most abject manner, to recal us, as orders had been issued to drive us out; which could not be carried into effect. He concluded that we must by that time have got so far on our way, that before we could be overtaken, we must have accomplished our object. At 1 A. M. of the 13th, we got under-weigh, towed as before; but escorted by a numerous fleet of war junks, one of which carried three lanterns, and the others, one each, on their poops; as all these vessels had to make short tacks in a narrow channel, the sight was rather fine; and when we reached Mingan, a number of rockets were discharged, which had a very grand effect. We had not permitted any Chinese officer to

come on board our boat when we started; but contrary to stipulation, they now again insisted on coming; while we showed a determined resolution to resist: on consulting their commander, they were directed to let us go freely. We lost our way however in the darkness of the night, and were assisted by a war-boat in the morning, in recovering it. As we approached the right channel, we found several war junks stationed as a guard. Three or four of them accompanied us for some time, but gradually dropped off. The towing junk too took occasion to make us over to a large open boat, from which we soon afterwards cast off. On passing the forts at the Bogue, we were honored with a salute of three guns from each, as well as from some war junks above, and others below, the forts. At 2 P. M., we got on board the "Findlay." In pursuance of our declared intention, I prepared a petition to the Viceroy, praying for inquiry into the conduct of our assailants on the 11th, and the infliction of adequate punishment upon them for their unjustifiable attempt on our lives. Mr. GUTZLAFF was good enough to put my petition into Chinese form, and have it ready for delivery next morning, in expectation, that as had been the practice hitherto, some officer of rank might come on board. None having arrived, however, I resolved to go on board the admiral's junk, and deliver my petition there, explaining its object to that officer. Mr. GUTZLAFF and Mr. STEVENS accompanied me; we found in the cabin two messengers from the Viceroy, both of them assistant magistrates, wearing colorless crystal knobs; two vice-admirals, Tsung-ping-knan, one of them, the naval commander-in-chief of this station; one colonel of the army, Yen-keih, and one Pa-tseang, or subaltern. Having handed to them the petition, one of the messengers wanted to open it; but on being requested to deliver it to the Viceroy, began to enquire what were its contents. Before coming to that subject Mr. GUTZLAFF adverted generally to our character as foreign merchants, and our wish to import rice. The Chinese assured us that it was from no unwillingness on their parts, that we were not allowed to trade, but that they were obliged to act under the prohibitory orders of the Emperor. As to the importation of rice, the Fú-Tseang at first affected to misunderstand us, as if our application were for permission to export rice to our own country from Fuh-kín. One of the messengers told us, that the Viceroy would give us no answer, when Mr. GUTZLATF quoted some instances of official replies from head-quarters, that made him waive this objection.

Having shewn them the impracticability of efficiently excluding foreign trade from so long a line of coast, Mr. GUTZLAFF urged very

strongly the expediency of rendering legitimate what was now conducted with all the defiance of the laws, and other evils attendant on a smuggling trade already so apparent in Canton. Both messengers assented very readily to the soundness of the advice, adding arguments of their own in a very conciliatory strain, and regretting much that it was against the imperial orders. Mr. GUTZLAFF dwelt particularly on the facility which Fuh-chow possessed for the tea trade: this they fully admitted; but again the Emperor having confined the trade to Canton, there was really no remedy; and it was quite in vain attempting to open the trade at this port. Mr. GUTZLAFF then adverted to the murderous attack upon us on the 11th; of this they at first alleged total ignorance, and then ascribed the attack to the treachery of the common natives. Mr. GUTZLAFF however told them, that it was their officers and soldiers who acted to the best of their ability the part of treacherous and cowardly murderers; while the poor peasantry had always conducted themselves towards us with the greatest kindness. That we were now come with a petition, calling for redress by the punishment of those assassins, the granting of which was the only means of preventing retaliation; the lives of peaceful people having been brought into the most imminent danger, which violence justified violence in return, even if we were to take a life for each of our lives that had been so endangered. Here all concurred in reprobating such conduct as we had experienced, and in assuring us, that we should meet with no such molestation from them, trying to put as good a construction as possible on the past. Mr. GUTZLAFF repeatedly requested them to allow the people to bring us provisions; but to this they turned a deaf ear. As we rose up to come away, the messenger of the Viceroy, to whom I had handed the petition, wished to return it; but I refused to receive it back. He said he could report what we had said; but durst not deliver the petition. Mr. GUTZLAFF, however, succeeded in getting him to promise its delivery, by reminding him, that he had been sent hither on our account, and it would be strange, if after all, we should be obliged to carry our remonstrance ourselves to Fuh-chow. This hint had the desired effect. On the afternoon of the 15th, a polite note was sent to the admiral's junk, requesting a supply of provisions, to be procured for us, as the people were prohibited from bringing any thing to the ship. The boat brought back a remnant of a shoulder of pork, a dried cuttle-fish, and four pieces of sugar-cane; these were immediately returned. Mr. GUTZLAFF was good enough to go on board by another boat, accompanied by Captain MCKAY and Mr. STEVENS, to require an explanation of this piece of rudeness; and to inform them

that if in two days I got no answer to my petition for redress, the consequences would not be imputable to me, but to their government. They at first denied that any thing had been sent; but finding this would not do, they alleged, that the pork and fish were intended for the boatmen, and the sugar-cane for the little lad that steered the boat. No indication of such appropriation was made when the things were put into the boat, so that the excuse was evidently an afterthought. Finding that another admiral, who had arrived in the forenoon, was of the party, Mr. GUTZLAFF again expatiated on the atrocity with which we had been treated. No attempt at defending it was offered. The messenger of the Viceroy said, that the petition had been sent, but he was unable to say, how soon we might expect an answer. At this second meeting, Mr. GUTZLAFF pointed out the freedom with which Chinese subjects were allowed to follow any honest avocation they chose at our settlements, and claimed, on the principles of reciprocity, the accordance of similar privileges in return.

On the 16th, Mr. GUTZLAFF, having found some passages of Chinese law particularly applicable to our assailants, went in the evening to point them out to the mandarins, and for their further consideration, copied them out in their presence, and left the extracts with them. Applications for provisions, and promises to supply them, were renewed. On the 17th, a boat arrived from Fuh-chow, at 8 A. M., and was received by the junks with a salute. A little after, a boat came alongside, and made off again with all expedition, after leaving an open note, stating that the orders of the Viceroy had arrived, and that we ought to go on board the admiral to receive them. Mr. GUTZLAFF wrote in reply, that the person who was charged with the communication of the order was in duty bound to deliver it, and that we expected he would bring it accordingly. This was sent by the ship's boat, which soon after returned with a note, stating that since we were afraid to go on board the admiral's junk, they had made out a copy of the order, not choosing to send the original by the young man whom we had sent in charge of the boat. The half hour that our boat was detained was entirely occupied in framing and copying this note. The paper which they pretended to have copied in that time was a roll nearly six feet in length, which could not have been written in the fair style which it exhibited by the most expert penman in less than a couple of hours. We afterwards compared it with the original, and found that it was written in the same hand, and was in every respect, except in the sealing, a fac-simile of the original. Our second petition accompanied this copy. The intention was no

doubt to cheat us out of the original—an object of some value in the eyes of the Chinese diplomatists, who are always anxious to withhold authenticated papers, for fear of furnishing documents that may some day be brought forward in evidence against themselves—a use to which no unsealed documents can be applied, according to Chinese law and practice. The possession of this copy enabled us to prepare a final communication to the Viceroy, and in order to secure the delivery into our hands of the original, the ship was dropt up with the flood abreast of the junk fleet, and her broadside brought to bear upon them. There were 19 vessels in all on the spot; but all the smaller ones immediately got under-weigh, and passed within the forts. When we went on board the admiral of the station, we learned that the orders of the Viceroy were addressed to the admiral of Haetan, who was on board another junk. He and the envoys from Fuhchow were sent for; but it was some time before they made their appearance. Our host, in the mean time, appearing very uneasy and dispirited, we asked what was meant by saying that we were afraid of going on board his ship. Some of us had been there on each day since our return. It was obvious, that fear of retaliation had prevented him from renewing his visits since we came back; but if we thought it right to retaliate it, we should not have imitated the treacherous and cowardly conduct of his countrymen, but openly brought our ship to fight the whole of theirs, and he must be perfectly aware, that as she then lay she could sink his whole fleet, and destroy every one on board. But this was not our object. The government had implicated itself in the business by inventing such a string of notorious falsehoods in defence of the conduct of its officers, and we should leave it to our Government to obtain for us the redress which theirs refused to our simple and respectful application.—The original letter of the Viceroy and his colleagues having been at last produced and taken possession of by me, I returned the copy sent in the morning. We were promised our supply of provisions as soon as we got underweigh. The final reply to the Viceroy, along with my second petition, under a fresh cover, were now placed in the hands of the principal envoy, who pressed me hard to receive them back, and even followed me out, as if he intended to throw them after me into the boat. Judging apparently that this would be of no avail, he kept them till evening, and then sent a small fishing boat with them to the ship. The fisherman, however, being warned off, carried them back, and we saw no more of them. On the 18th and 19th, we gradually dropped down to the outer bay. No provisions were ever sent us.

IV.—*Selected Specimens of the Sub-Himálayan Fossils in the Dádupur Collection. By Lieut.* W. E. BAKER, *Engineers.*

The discovery of the existence of fossil organic remains, in the vicinity of the village of *Ráyawála*, and in the *Markanda* pass, has led to the examination of the tract of tertiary hills lying between the river *Jamna* and *Pinjor*. From different points on this line, specimens have been obtained, and the fact of its richness in such relics fully established.

The greater number of the specimens in the *Dádupur* collection, are from the hills lying between the *Markanda* pass and *Pinjor*. The calcareous sand-stone prevalent in these formations has usually appeared as the matrix containing them; an exception, however, occurs in the neighbourhood of *Dádgarh*, where the matrix, instead of sand-stone, is a red indurated marl, in which not only the remains of Mammalia and Reptilia are found, but those of Mollusca also. The native collector reports them to occur together, and along with the shells, produced fragments of bones and vertebræ of Saurians. Having as yet had no opportunity of visiting the place, I can neither corroborate his statement, nor particularise the site of the deposit. The shells appear to belong to fresh water species; they are not abundant, and are generally in a bad state of preservation. The red marl is with difficulty disengaged from the specimens; any attempt to separate the shell from the matrix, being usually at the expence of the epidermis, and too frequently at that of the valves themselves. Nos. 45, 46, 47, 48, (Pl. XLVIII. $\frac{1}{2}$ size,) shew the usual state of the specimens; the varieties are few in number, but the determination of fossil species requires so much experience and nice discrimination, that no apology will be requisite to excuse silence on this interesting point. A selection, which is to be placed at your disposal, will, it is hoped, afford the means of determining the question. The univalves bear a small proportion only to the bivalves, being in the ratio of 1 to 100; it must, however, be remarked, that the quantity hitherto collected being small, the above proportion might be materially affected by an inconsiderable increase to the number of specimens*.

* We have ventured to preface Lieut. BAKER'S enumeration of the principal Sub-Himálayan fossils of the *Dádupur* collection by the above extract from a paper previously drawn up by his friend and coadjutor Lieut. DURAND, on the remains of the hippopotamus of the same field, for the sake of pointing out the locality in the extensive range of lower hills, whence they have been exhumed. Lieut. DURAND'S beautiful drawings, being, from their size, better adapted to the pages of the Researches, will, in the first instance, receive publication in

The accompanying plates contain drawings $\frac{1}{4}$th the natural size of a few of the Sub-Himálayan fossils in the Dádúpur collection, viz. selected specimens of the remains of the horse, the hog, ruminants and carnivora.

To save a lengthened description, and the use of technical terms, with which I am not familiar, as well as for the sake of ready comparison, I have accompanied my drawings of several fossils by those of the corresponding bones of their existing analogues.

I may here remark, that the greater part of the fossil, as well as of the recent bones, were sketched with the assistance of the Camera Lucida, and allowing for the slight errors incidental to that instrument, I believe them to be correct "plans and elevations," if I may use the term, of what they are intended to represent.

The fossil horse—Pl. XLV. figs. 1 *to* 19.

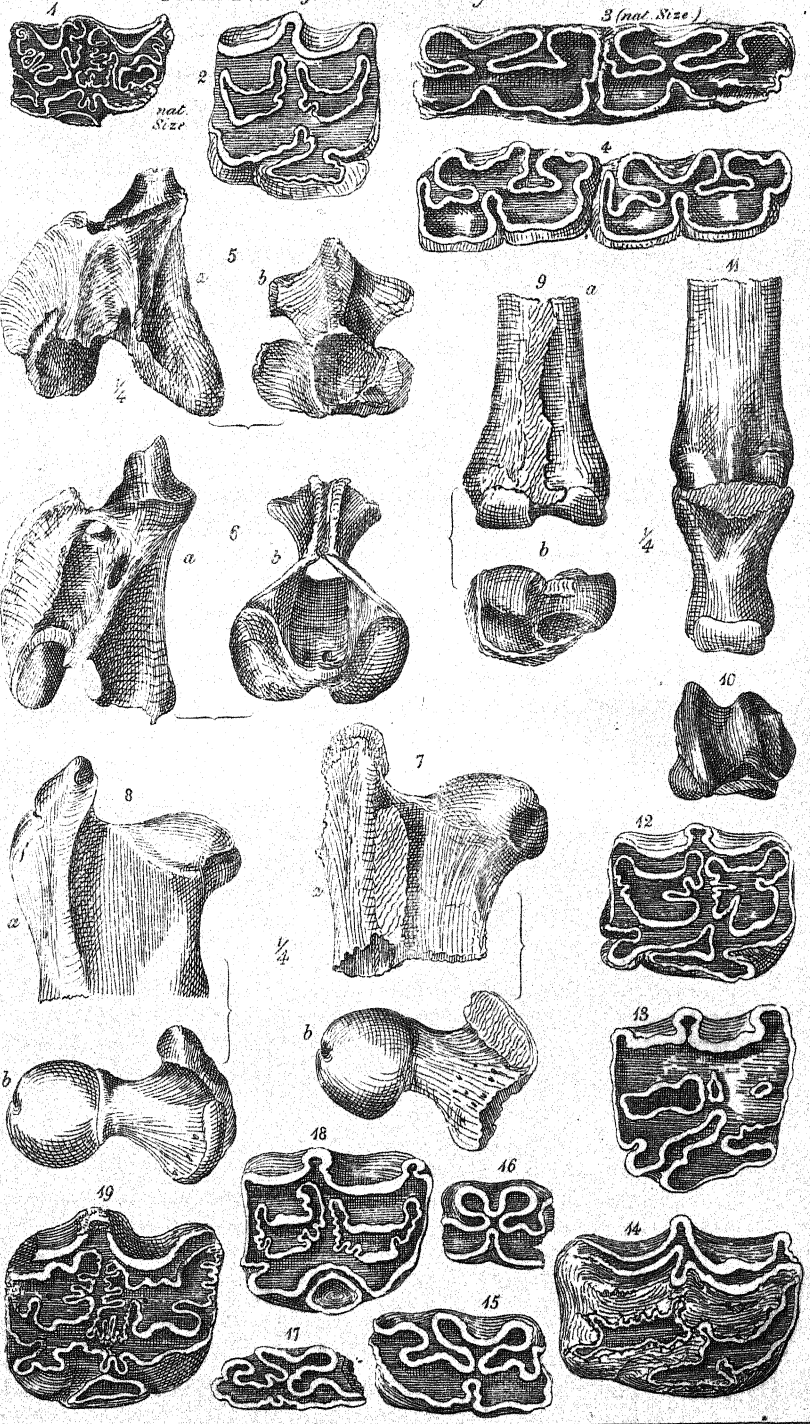
The remains of this animal, now in our collection, are amongst the latest of our acquisitions; and as many of them present a marked difference from the fossil horse, described by CUVIER, which appears not to have been distinguishable from the existing species, I have been induced to figure nearly all our recognized bones of this genus.

Fig. 1 represents a fragment of a left molar of the upper jaw; though a mutilated specimen, it clearly shews the same complicated flexures of the crown, compared with fig. 2, which is the fourth left upper molar of the existing horse. Fig. 3, shews the fourth and fifth molars of the left lower jaw of the fossil, and fig. 4, the same teeth of

the volume now in the press, along with the highly interesting description of the *Sivatherium*, by Messrs. FALCONER and CAUTLEY.

The shells of the red marl, alluded to above, are *perfectly identical*, both in form and state of preservation, with those we received with the collection of Ava fossils from Colonel BURNEY. No drawing is given of these shells in Professor BUCKLAND'S account of the Burmese Mastodon, and he remarks, that "neither the insulated concretions from Ava, nor those adhering to the bones, contain traces of any kind of shells;" but on noticing the peculiarities of the tertiary strata in the neighbourhood, he says, "among the most remarkable of these strata is a fresh-water deposit of blue and marly clay, containing abundantly shells that belong exclusively to a large and thick species of *Cyrena*." This doubtless coincides with figs. 45, 46, of our plate:—and further, "also a dark-coloured slaty lime-stone, containing shells which Mr. SOWERBY has identified with some that occur in our London clay. There is also, from the hills opposite Prome, granular yellow sandy lime-stone, containing fragments of marine shells, and much resembling the calcaire grossièr of the environs of Paris." This I presume alludes to the spiral univalve, fig. 44, which I find precisely among Colonel BURNEY'S specimens, and which much resembles the principal shell of the calcaire grossièr.—ED.

Fossil Bones of the Sub-Himalayas - Horse.



Fo. sviegepadam

the recent horse: between these, the difference, though obvious, is less remarkable than in the upper teeth.

The fossil axis, fig. 5, differs from the recent fig. 6, in its greater proportional breadth, and the greater expansion of its lower articulating surfaces, *a. a.*

The fossil femur, (fig. 7,) or rather its upper extremity, has a strong resemblance to the recent fig. 8; a slight difference only appearing in the form of the condyle, and the greater flatness in the fossil, of the space between the condyle and trochanter.

In the lower extremity of the radius, (fig. 9,) in the astragal, (fig. 10,) in the metacarpal and phalanx, (fig. 11,) I am unable to detect any distinctive difference from the corresponding parts in the recent horse.

To the above collection, I have since been enabled to add further drawings of the fossil teeth of the horse, to aid in determining whether it exhibit any difference from the existing species.

Figs. 12 to 18, are from specimens in the cabinets of Captain CAUTLEY, with whose permission I send them. Fig. 19, is from a tooth now belonging to Colonel COLVIN, and by him intended for presentation to the Asiatic Society, who will, I trust, excuse the liberty I have taken in drawing it, which I would not have done, had our own specimen (No. 1 of my last sheet) been sufficiently perfect to stand for the type of the species found in the upper formation.

Figs. 12, 13, 14, 15, 16, 17, are from the bed of the Jamna, between Agra and Allahabad.

Fig. 12, appears to be a right upper molar, perhaps the 3rd: this very perfect specimen has a close resemblance to the teeth of the existing horse; but the flexures of its enamel are undoubtedly more complicated than those of the specimens of horse and ass, with which I have compared them. The pillar, *a*, is also much longer, though the proportions of this part are doubtless affected by the degree of attrition to which the tooth has been subjected, as will be seen more clearly in figs. 13 and 14; of which,

Fig. 13, is from the right side of the upper jaw of, apparently, a very old animal; it may be observed, that the pillar, *a*, is very much enlarged.

Fig. 14, is also from the right upper jaw. I suppose it to be a young tooth, of which the flexures of enamel have not completely burst through the original envelope, and have not been worn down to the usual form: in this, as was to be expected, the pillar is small.

Fig. 15, is the 2rd or 3rd molar of the jaw, right side.

Fig. 16, a fragment of a similar tooth.

Fig. 17, probably the rear molar of the right lower jaw; these three present no remarkable difference from similar teeth of the recent horse.

Fig. 18, is the beautiful specimen from the marl formation in the *Kálawála* pass, alluded to by Dr. Falconer, in his letter, read to the Society on the 14th January, 1835.

Fig. 19, the 2nd or 3rd right upper molar from the upper or sand formation of the Sub-Himálayas: there is a slight difference between the flexures of enamel of this, and of the fragments, fig. 1, of my own collection, but not more than is perceptible between the several molars of the present horse.

From the above specimens, (if I may be allowed to generalize from so few,) it would appear, that we have three varieties of upper molars of the fossil horse.

1st. From the **lower* marl formation, (*Kálawála* pass,) fig. 18. This tooth is distinguished from the recent, and from the *Jamna* varieties, by the pillar, *a*, being detached from the rim of enamel encircling the rest of the tooth, (as was remarked by Dr. Falconer,) and from the 2nd (undermentioned) variety, by the comparative simplicity of the flexures.

2nd. From the sand formation, fig. 19.

In this variety also, the pillar is detached, but more elongated, than in the 1st; the interior flexures are remarkably complicated.

3rd. From the bed of the Jamna, between Agra and Allahabad. In this the pillar forms a part of the exterior rim of enamel: in shape it resembles that of the 2nd variety, but the interior flexures are more like those of the 1st. It appears doubtful, whether or not this last variety will be considered identical with the existing species.

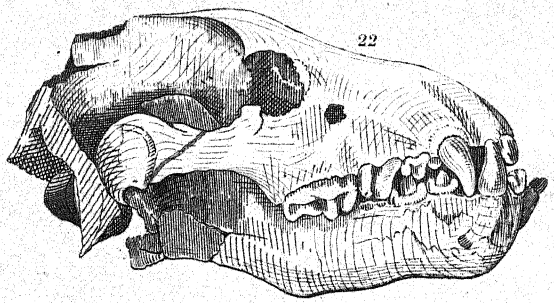
Fossil hog—Pl. XLVI. figs. 20, 21.

The specimen represented by fig. 20, is in its substance so soft and friable, that it was difficult, without destroying the fossil, to remove even so much of the matrix as enabled me to take the accompanying sketch. It must still remain in doubt, whether the exterior incisors be wanting, or whether they be only concealed under the sand-stone, covering the parts *a*, *a*. I am myself inclined to the latter supposition, from the close agreement in other respects of this fossil with the lower jaw of a wild sow, lately killed in the *Ráyawála* jungles; in both instances the molars appear to have been very much worn. The comparative sizes of the fossil, and the above-mentioned recent specimen, are 21 and 17.

* An *upper* marl has also been met with, containing shells, and the teeth of crocodiles. See remarks in page 565.

Fossils of the Sub Himalayas - Dadupur Collection

22

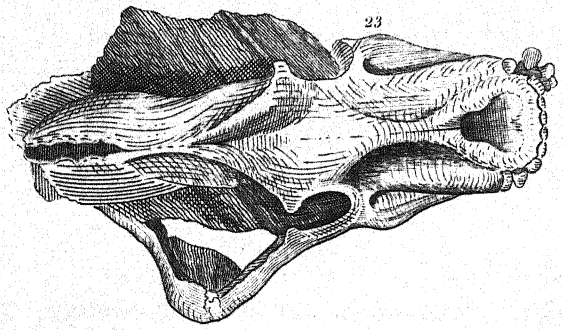


Hyæna - fossil

20

fossil Hog

23



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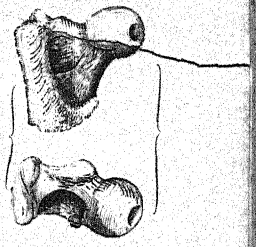

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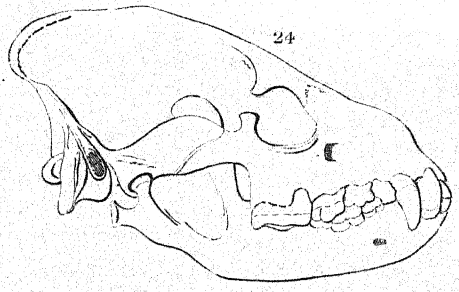

Hyæna - recent.

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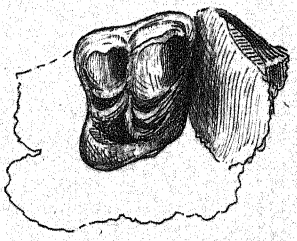

½ th larger than nature

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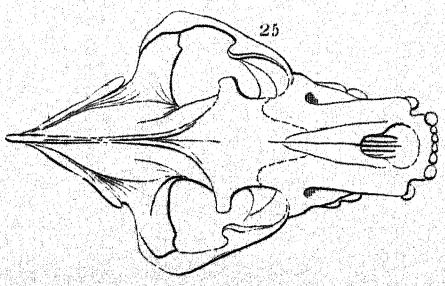
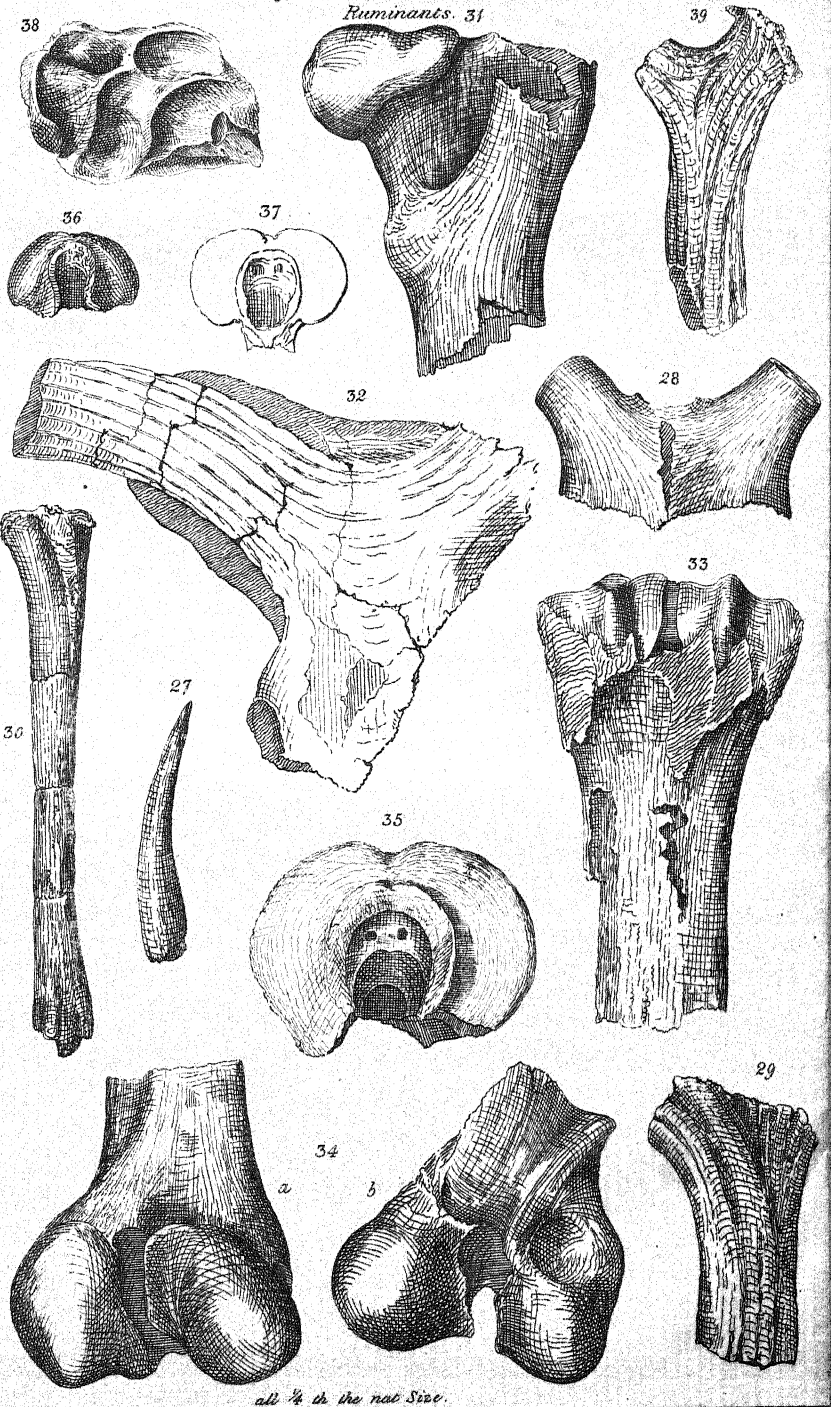


Linear Dimensions - one fourth of the natural size

Fossil Bones of the Sub-Himalayas - Dadupur Collection

Ruminants.



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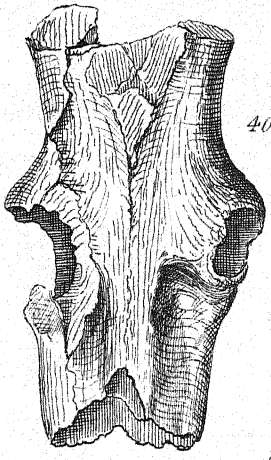
The Newberry Library

Fossil Bones of the Sub-Himalayas-Dadupur Collection

Antelope.



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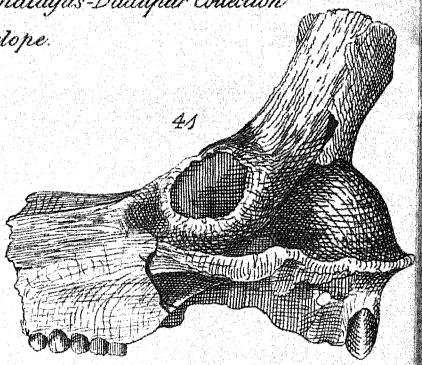

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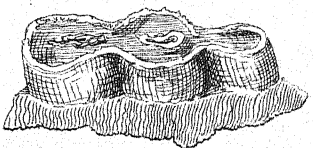

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nat Size.

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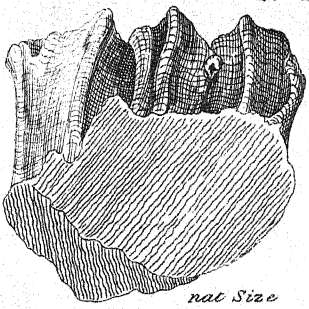

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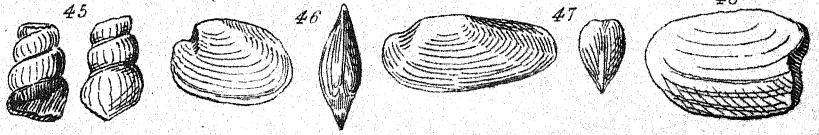
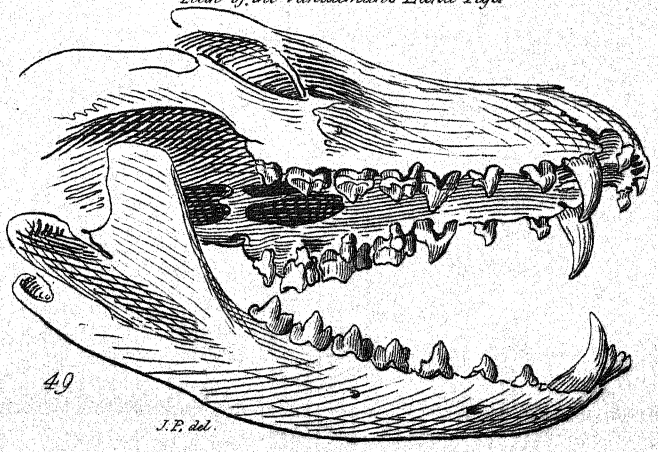
nat Size



45 46 47 48

Teeth of the Vandieman's Land Tiger



49

J.P. del.

To Sringapatam

The upper part of the femur, fig. 21, must have belonged to a smaller animal; it is chiefly remarkable for the lowness of its trochanter major.

Carnivora.—Pl. XLVI.

Amongst our fossil remains of this family, the hyena is the most abundant. Of other genera, we have one fragment of a head, which even the assistance of CUVIER has not enabled us to name with certainty. We have also a molar indubitably belonging to an animal of the genus canis.

Of the hyena, there appear to be two varieties: figs. 22 and 23, may be considered the type of one; of the other I will say nothing, as the Society will shortly be in possession of specimens of it, now in the collection of Colonel COLVIN.

The skull represented by figs. 22 and 23, is the most perfect fossil we have yet been so fortunate as to meet with. It appears to have been enclosed in the stratum, with the lower jaw in position, but not quite closed. The only injuries which it has sustained are the loss of its left zygomatic arch, a slight displacement of the half of the lower jaw, of which the canine tooth is broken off near its base, and the mutilation of the occiput, which is perhaps the greatest loss of all.

This skull must have belonged to a full-sized animal, as some of the molars are worn flat at the tops: it is smaller then CUVIER's fossil hyena, and somewhat different, though having a much nearer resemblance to it than to the existing hyena of the country of which I have given the skull, figs. 24 and 25, With reference to the latter skull, I have to remark, that it was brought from the lower hills in this neighbourhood, and said to belong to the *charakh* چرخ or hyena; it however wants the small first molar of the upper jaw: and in the disposition of the molar teeth of the same jaw, slightly differs from another less perfect skull of a hyena, with which it has been compared. Whether or not these differences may be attributable to age (for the individual was evidently a very old one), or to accident, I cannot determine.

Fig. 26, is the fifth, and part of the fourth left upper molar of a canine animal.

Ruminantia—Pl. XLVII. XLVIII.

Of this order we possess a great diversity of species, of which some individuals appear to have been of gigantic dimensions, as may be judged from the specimens which I have selected to illustrate this point.

Figs. 40, 41, and 42, are different views of a skull of an animal allied to the antelope; the length and narrowness of the face, the

height of the nose, and the peculiar setting on of the horns, are all more conspicuously exemplified in another specimen of a similar skull, which Colonel Colvin purposes presenting to the Asiatic Society. Our specimen, however, has the advantage of possessing the cranium and occiput entire.

Fig. 43, is the last molar of the left lower jaw of an antelope or goat.

Fig. 27, a horn, perhaps of a similar animal.

Fig. 28, part of the frontal of a small stag.

Figs. 29 and 39, ditto antler ditto.

Fig. 44, milk molar of a stag.

Fig. 30, tibia of a stag or antelope.

Fig. 31, fragment of head of a femur of bos.—This specimen, compared with the similar part of the domestic buffalo, is in size as 5 to 4.

Fig. 32, fragment of head of a bos.—This has a general resemblance, as far as it goes, to the very perfect one offered to the Society by Mr. Dawe.

Fig. 33, lower extremity of the metacarpal of a ruminant: compared with that of buffalo, as 83 to 45.

Fig. 34, *a*, *b*, two views of the lower extremity of the femur of a bos, one-third longer than the longest of which I have met with a description in Cuvier; its width across the condyles is 6·2 inches.

Figs. 35 and 36, are two similar fragments of axis, which I have selected to show the diversity of size of our fossil ruminants: to complete the comparison, I have added the corresponding bone of the small plough bullock of the country, fig. 37.

Fig. 38, is a lower extremity of a radius, compared with the corresponding bone of the bullock, as 18 to 7·5.

It is not impossible that some of these large bones may hereafter be found to belong to Capt. Cautley's Sivatherium*.

Seharanpur, July 9th, 1835.

* *Sivatherium.*—The name given by Capt. Cautley and Dr. Falconer to one of the recently discovered fossil animals, of which their description has just been published in the Society's Researches. We shall take an early opportunity of republishing the account of this important discovery, so fraught with interest to the geologist and the naturalist.

It will be seen by the extract of a letter from Captain Cautley, read before the Society at the Meeting of the 4th November, and published with the present number, that this conjecture is completely confirmed; and that other animals, particularly the Anoplotherium of Cuvier, have been added to the growing catalogue of *Sewálik* fossils.—Ed.

*V.—*List of Fossil Specimens from Bilwan, and from the Betwá, collected by Lieut.* VICARY, *in December,* 1834.

Right branch to the 13th tooth of the lower jaws of a crocodile, I believe the muggur *(magar)*; all the alveoli are empty, except the 7th, which contains a germ.

The scapula, part of a rib, and another bone of the same animal: all found together within 300 yards of the *Bugowtí*, about a mile to the N. W. of the village of *Bilwan*, between *Mirzapur* and *Chunar*: they were bedded in clay, mixed with *kankar* and some shells like those of the river; the clay rests on sandstone, which was exposed in the bottoms of the water-courses.

A bone, found on the surface, at the same place.

From the Betwá in Bundelkand, January, 1834.

Bones of a bovine animal, found imbedded in cemented gravel, on the right bank of the *Betwá* river, about one mile east of *Jelálpur*, between *Kalpí* and *Keitah*.

No. 1.—Clay on which the gravel rests, and which forms the bed of the river on that side.

No. 2.—The cemented gravel in which I found the bones, at this place; it is about twenty feet in thickness. Half a mile nearer to *Jelálpur*, it decreases to two feet; and in some places, is very slightly cemented.

No. 3.—The bones: some had fallen to the base of the gravel, and were lying on the surface; others were still firmly imbedded, and broke in the effort to get them out. (I had not a hammer with me.)

No. 4.—Stems or roots? (Dendritical *kankar* perhaps,) above the gravel; in a light colored clay, of about four feet in thickness.

No. 5.—Plate *kankar*, alternating two or three times with the above clay, containing shells not differing from those of the river, and often perforated by the *roots*?

a. A thin seam, resting on sandstone in the *Sonar* river, at the waterfall near *Hatta*, containing shells (recent).

b. A bone from the left bank above the same fall.

c. A bone from the *Byarmí* river.

* This paper was accidentally mislaid, when the article on the Jamna fossils, of the last No. was in the press. It is referred to in page 502 of that paper, and is here printed both to illustrate the remarks there made, and to preserve the record of Lieut. VICARY'S donation. The *Mirzapur* site of fossils is new, and deserves further examination. In regard to the theory of the Jamna fossils being derived from the *Betwá* river, Mr. DEAN has pointed out to us that *Karim Khán* is 20 miles above the junction of that river.—ED.

VI.—*Note on Thylacinus Cynocephalus. Extracted from the Osteological Section of the Catalogue of the Museum of the Asiatic Society.* By J. T. Pearson, *Esq.*

Class—Mammalia. *Order*—Carnassiers. *Fam.*—Marsupiata. *Gen.*—Thylacynus. *Sp.*—Thylacynus Cynocephalus.
Van Diemen's Land Tiger.

A Skull.

This specimen (Pl. XLVIII. fig. 49) was taken from the skin of an animal called the Van Diemen's Land Tiger, presented to the Society by Dr. J. Henderson; and described in the 3rd vol. of the Gleanings in Science, by Dr. J. Grant.

It was before described in the 9th vol. of the Transactions of the Linnæan Society, by Harris: and it is mentioned in the Synopsis of Mammalia of Griffith's Cuvier, under the name of Dasyurus Cynocephalus. Mr. Brooks, as it is there stated, thought it the type of a new genus, to be named *Paracyon*: and M. Temminck has since formed it into one, under the name of *Thylacynus*. In all these, however, the dentition is incorrectly given. In the Linnæan Transactions, and in the Gleanings in Science, the cheek teeth are represented as $\frac{6}{7}\frac{6}{7}$, and in the Synopsis of Griffith's, the dentary system of Dasyurus is attached to it, viz. incisors $\frac{8}{6}$; canines, $\frac{1}{1}\frac{1}{1}$; cheek teeth, $\frac{6}{6}\frac{6}{6}$. So far as relates to the incisors and canines, Griffiths is probably correct; for, although some of the incisors are wanting in the present specimen, there are eight sockets above, and six below; the second on each side of the latter being situated apparently within the row of the other four, as happens to the middle incisors of Brooks' genus *Lycaon*. The dentition of *Thylacynus* is therefore, incisors, $\frac{8}{6}$; canines, $\frac{1}{1}\frac{1}{1}$; cheek teeth, $\frac{7}{7}\frac{7}{7} = 46$, and omitting the incisors, some of which are wanting in the present specimen, the teeth may be described as follows:

Superior maxilla—*canines* strong, large, and curved backward, with the points inclining rather inward; separated from the incisors by a deep, round fossa, or hollow, nearly half an inch in diameter, to receive the point of the opposing canine of the lower jaw. *Cheek teeth* gradually increasing in size to the last but one, which is the longest. The three anterior ones are compressed, cuspid, with a heel at the posterior side; but little developed in the first, more so in the second, and largely in the third, where it is formed into almost a sharp tubercle. The fourth, fifth, and sixth cheek teeth irregularly triangular, with the most obtuse angle forward and outward, and the most acute, backward and outward. The fourth tooth has a

tubercle at each anterior angle, the outer one having a point, forming a small heel before it; a larger and sharper central process; a very small additional point arising out of a concave surface between the central process and posterior angle; and a curved, sharp, cutting edge extending along the inner and posterior side of the tooth, from the central process to the posterior angle. The fifth tooth is, in general appearance, similar to the fourth, but rather larger than it; with the central process longer in proportion, with only a rudiment of the small point of the concave surface, and the posterior and inner cutting edge larger and sharper. The sixth tooth is the largest: the heel of the anterior tubercle is more strongly developed, and the outer and central processes are larger and sharper than in the other teeth; the posterior interior cutting edge is very sharp, and there is scarcely a trace of the additional point. The seventh tooth is also triangular in its form, but with its longest axis placed cross-wise, with an obtuse anterior interior tubercle, another posterior one, and a third rather sharper than those in the centre, with a sharp elevated ridge extending across to the most acute angle at the outer side, uniting the central with a fourth tubercle at the outer angle.

With regard to the placing of the teeth in the jaw: the sockets of the four incisors on each side are close together, but between those of the two central incisors there is an interval of about $\frac{1}{10}$th of an inch, indicating a corresponding gap between the teeth. Between the incisors and canines there is the pit in the intermaxillary bones already mentioned. The first molar is almost close to the canine of its side; the second molar is separated by an interval of $\frac{2}{10}$ths of an inch nearly, from the first; the third molar is rather more than $\frac{1}{10}$th of an inch from the second, and it adjoins the fourth, forming with it, the fifth and the sixth, a continuous series of four teeth, from which the seventh is separated by about $\frac{1}{10}$th of an inch.

Inferior maxilla—*canines* strong, much curved, approximating at the base, then proceeding outward, with the points turned backward, and rather inward; placed close to the incisors, which appear jammed between them; and the points not going on the outside of the intermaxillary bones when the jaws are shut, but received into the fossa in those bones, between the upper incisor and canine teeth. *Cheek-teeth* gradually increasing in size to the third, than which the fourth is rather smaller; and again, from the fourth to the last, which is the largest of all: first, second, and third, like those in the upper jaw: fourth, fifth, sixth, and seventh tricuspid, with an acute angular point in front, a very elevated sharp process, with cutting edges in the centre, and a tuberculous process behind. This last

process approaches to a grinding surface, with an acute margin at the outer and posterior sides, in the fourth, fifth, and sixth teeth; and it is of a rather round, tuberculous form, in the seventh tooth.

The first molar in the under jaw is placed close to the canine tooth of its side; the second is about $\frac{1}{16}$ht of an inch from the first; the third rather more from the second; and there is another space between the third and fourth of about $\frac{1}{16}$th of an inch: the four last teeth form a continuous row.

The lower canines being received into pits in the intermaxillary bones, is somewhat like an approach to what takes place in some of the Saurian reptiles; and indeed, the whole view of the skull of Thylacynus Cynocephalus reminds the casual observer almost as much of a Saurian as of a Mammiferous animal.

When presented to the Society, the stuffed specimen was, as it is said, in a bad state; and when the present Curator entered upon his office, there was, owing to no care having been taken of it, nothing to be done, but to take out the bones, to preserve them. This, however, was so far fortunate, as it has led to the discovery of the real dental system.

Mr. Grant, who drew up the paper in the "Gleanings in Science," proposed the name of Lycocephalus for this species, apparently not aware that Harris had before named and described it. His mistake as to the number of teeth arose from not having been able to open the mouth far enough to allow him to examine them properly; and Harris's specimen may have been an old one, and lost a tooth on each side. The Society's specimen was of a middle age, rather young perhaps than otherwise: the bones of the skull being well knit together, though not fixed by bony union.

It is greatly to be wished, that some friend to the Society would present another specimen.

VII.—*Analysis of Copper Ore from Nellore; with notice of the Copper Mines at Ajmír and Singhána.* By James Prinsep, *Sec. &c.*

Through the kindness of Mr. C. A. Kerr, I have had a further opportunity of examining the produce of the Nellore copper mines, of which cabinet specimens were presented to the Asiatic Society two years ago*, before the formation of the "*Indian Copper Mining Company*" at Madras, for the purpose of turning to profit the mineral stores of this promising district.

* See Proceedings of the Asiatic Society, Feb. 1833, in vol. ii. p. 95.

From a pamphlet published at Madras, we learn that the copper mines in the Nellore and Cuddapah districts were discovered about 40 years ago, by Mr. BENJAMIN HAYNE, whose report to Government, inserted in his *Tracts on India*, gives the fullest and most satisfactory account of them. From this pamphlet, we glean the following particulars of the locality, and of the quality of the ore.

"The districts on the coast in which copper ores have been discovered are those of the Calastry and Vencatagherry zemindaries, and the Udygherry Jaghire, in the zillahs of Nellore and Duppaud, and other places in the ceded districts.

"The principal mining places are at the distance of about 30 miles N. W. from Nellore, 30 miles from the sea, about the latitude of Rámapatam, and about 40 miles N. E. from Cuddapah.

"Several rivers run right through it on their way to the sea from the western hills, of which the Pillapeyroo, Vuppovagoo, and Manyroo form a junction not far from Guramanypenta, the principal mining place, and form a pretty large river, which is said to have a good deal of water throughout the year. Its beds are very stony, which seems in the eyes of the natives the greatest objection against its being made navigable for boats: it deserves therefore an accurate survey.

"The general aspect of the country is barren, and uncomfortable in the extreme: large trees are only found in and near the villages; and on the wide extended plains, on both sides of the river, nothing encounters the eye, but here and there a small thorny shrub. The grass, which, in the rainy season, every where else carpets the country with a refreshing green, is here both scanty and of the poorest kind, a species of "aristida," which, as the name implies, is a compound of long beards or bristles. This is the case in most mining countries; the surface of the soil contains in many places so much salt, that the inhabitants could make enough, if allowed to do so, for their own consumption.

"To the eastward, the country is open; only here and there a few low hills are to be seen; but to the westward, there are ranges of hills, the nearest at the distance of about 10 miles. Due west is one called Malla-coudah, from being the highest hill in the range. It is said to abound with wood. The Udygherry mountains are to the south-west, about 16 miles, and the highest in this part of the country: the highest point I take to be about 3000 feet above the level of the low country: I have seen myself, that plenty and large wood grows there, particularly between the valleys.

"About 20 miles on the way to the sea, in the direction of Rámapatam, are extensive jungles, consisting of—1. Korra, *Panicum italicum*, *L.* 2. Aruga, *Paspalum tomentacium*, *L.* 3. Woolava, *Glycene tomentosa*, *L.*

"This country is, geologically speaking, of a primitive description; the general rock formation is a mica-slate, of different colors and consistence. It shews itself first in the low country, at the distance of about 15 miles east from the hills; it forms sloping mountains, which are often capped with horn-stone slate, which passes into sand-stone, and on the other hand, into jasper. The tabular summits and mural precipices of the Udygherry hills consist of the latter stone kind: the layers or strata of the mica-slate occur in different positions, and inclination to the horizon; often in the low country forming a right angle with it; on and about the Udygherry hills, the strata appear in the utmost confusion, as if thrust by force out of their proper position. Traces of copper ores are often found

in this rock, and it is generally known to contain various metallic veins, as gold, silver, and copper.

"Subordinate to the former is green-stone slate, in mighty layers, often as to appearance constituting the principal rock of a district for many miles. This is the case about Guramanypenta and the other mining places. The layers or stratification of the latter rock I have as yet always found in a horizontal position.

"The green-stone slate is often approaching to green-stone; it occurs then only obscurely slaty, has a jet black color, strong glossy lustre, foliated fracture, hard in a small degree; in this state it seems here barren of metals of any kind. The real green-stone slate is of a bluish black color, with small white spots of decomposed felspar, half hard; and when exposed to the air, it crumbles soon to pieces, and takes a green color. The rock is reckoned one of the richest '*mothers of ores*' of any in the world. In it are found silver and copper in rich beds or layers, as is the case here; but never in veins, as in other formations*.

"The layers of copper are of different thickness, and distances from each other: the general run of the pieces of ore, constituting the layers, is two inches in thickness; but they have been found also of several feet. The pieces are in general flat, as if compressed, and coated with ochre. The vertical distance between the layers is 4 to 8 feet, and the horizontal is even more uncertain.

"A corroded honey-combed quartz is found in great abundance in the green-stone slate, particularly along with the copper ore. It appears often on the surface, in such places where the water has washed the earth away. It looks then like indurated marl, which in other parts of the country is very common.

"The rock† is covered with a red coarse gravel, which is the superficial soil of this part of the country. In my opinion, this is formed from the decomposition of the green-stone slate, and its quartzoze and ferruginous contents; for copper ore is often found in it in considerable quantity, and in the same situation, as in the slate rock.

"At Yerrapillay, in a new mine, which I opened, I found two layers of ore in it, at distances of four feet asunder.

"The thickness of this stratum of gravel differs according to its situation, whether it is on a high or low ground. I have found it from 4 to 6 feet, and more.

"The copper ore which Dr. THOMSON calls Anhydrous, the most common kind, is in flat pieces, externally, of a brown ochry color; internally, of a black iron color, which often passes into green; when moistened with water, it becomes almost immediately throughout green; in some places, it is bluish grey throughout. Lustre, in some places, where it is black, semi-metallic; and in the bluish grey, metallic‡. The copper indeed

* One of my specimens from Nellore is abundantly curious and interesting. It consists of distinct layers of the carbonate, alternating with black micaceous schist, or rather green-stone, affording exactly the appearance of gradual deposition from a liquid at this earliest period of geological formations. The angle formed by the strata of this striated rock with the horizon is stated by Mr. KERR to be about 45°.—J. P.

† See Dr. BENZA'S observations on veins of quartz pervading decomposed pegmatite, J. A. S. iv. 421.—ED.

‡ This description accords so completely with that of No. 3, in the subjoined analysis, that I have no doubt Dr. HAYNE has mistaken the sulphuret for Dr. THOMSON'S ore.—J. P.

is in an almost metallic state in it. Fracture approaching to even fine grained streak; of the black, brighter metallic; powder, "*greenish;*" not very hard, except the iron black and bluish grey part; which is with difficulty scratched by quartz; brittle; not particularly heavy. Specific gravity, 3.09. Some pieces are found of a nut brown color, and some with conchoidal fracture. The foreign admixtures are various, as white and green quartz, mica, iron ore; mountain blue and malachite are in some places found with it. In other places, I suspect the admixture of silver. For the analysis, I must refer to that of Dr. THOMSON, in a paper laid before the Royal Society of London, which I was permitted to publish as an appendix to my "*Tracts on India.*" I will only mention here, that on an average, he procured 50 per cent. of pure copper. In the dry way, or by simply smelting the ore, we have received the metal in *greater proportion*, which may be easily accounted for by the quantity of iron, which the ore contains, that cannot be separated, as when the analysis is carried on by acids and other re-agents."

Mr. HAYNE seems to have been wrong in imagining, that the natives had only discovered these mines 50 or 60 years before (about 1750). Mr. KERR, who has since visited the whole of the mining district, and examined all the formations, and the old works, with great care, states, that the former excavations are of prodigious magnitude, many of them occupying several hundred feet square, and having a depth of 50 or 60 feet. The matrix rock and rubbish are now accumulated in these immense tanks; but on clearing them away, the mouths of the galleries extending into the rocks were discovered; blocks of the ore, (perhaps some that had been gathered previous to the discontinuance of working the mines from some political convulsion or oppression,) have been used to mend the village tank at *Guramanypenta;* and Mr. KERR imagines, that any quantity of the richest ore* may be obtained at a trifling expence, and within 100 feet of the surface. Extensive hills, formed of lumps of ferruginous slag, now covered with vegetation, point out the situation of the ancient smelting houses. A piece of this slag (which was at first mistaken for a volcanic product) was analysed by myself. It yielded but faint traces of copper, shewing that the native processes of extraction, however rude, were effectual in completely separating the metal. But I must now proceed to observe upon the actual specimens of the ore submitted to my examination, purposely avoiding all allusion to the mercantile value of the mines, the estimates of the expence of working them, and the invitations to join in an association for this purpose:—objects which are highly interesting to the community, connected with so laudable a measure for developing the natural riches of

* The "steel-grained, crystallized silvery ore, invariably found in green-stone slate, and partly imbedded in quartz, the richest ore met with," is doubtless No. 3, the sulphuret.—J. P.

the country; but which cannot with propriety be entered upon in a work devoted exclusively to literature and science.

The ores now presented to me are from three different localities. They differ considerably in quality one from the other, and all from the former ore, which Dr. Thomson pronounced to be an anhydrous carbonate, new to mineralogy.

No. 1. A parcel, weighing 90 lbs. of roughly-picked and cleaned ore, has a quartzose matrix, in some parts colored green, or appearing so from the malachite beneath the transparent crystal. It contains much iron, which, on solution in an acid, appears in the form of a yellow ochre. Ten per cent. of quartz was separated from this specimen on pounding it roughly, before setting it apart for analysis.

No. 2. A parcel of the same weight is labelled "*Bungeral Mettah*," and is the species stated to be found in clustered nodules in the alluvium, of rounded exterior, as though they had been detached from their original site, and reburied here. The ferruginous matrix of this ore, on solution, assumes the appearance of a dark-red oxide. It is the same probably as that of Dr. Thomson's specimen. The carbonate of copper runs through it in veins, but the mixture of sulphuret of iron and perhaps of copper with the oxide, gives the whole a dark arenaceous texture.

No. 3. The richest ore of the three is at the same time the most abundant, and promises to yield the safest return, as it runs in unbroken veins. This ore is a combination of carbonate and sulphuret, the former intermixed with the latter, but readily distinguishable from it, as the sulphuret is crystallized, and has the grey metallic lustre of galena. The specific gravity of this ore is 3·77, being intermediate between that of the carbonate, 3·2, and the sulphuret, 4·5.

The analysis was conducted for the sake of expedition on separate parcels of 100 grains each, in lieu of attempting the separation of the ingredients from a single parcel. Some variation may thus be induced from the irregularity of the ore; but, on the whole, the results ought to be more trust-worthy. Thus: the carbonic acid was estimated by the loss of weight on digesting 100 grains, finely pounded, in dilute nitric acid. The water, (for none of these ores was found to be anhydrous,) by heating in a glass tube, removing the aqueous vapour by bibulous paper, and ascertaining the loss. As the ore generally lost its green colour by this operation, it is possible that a portion of carbonic acid was also driven off. Calcination in an open dish, in the muffle of an assay furnace, gave a loss, which was compounded of that of the carbonic acid and the water. Calcination drives off the sulphur also, but the equivalent of oxygen, which replaces it, being of precisely

equal weight, this operation affords no test of the quantity of sulphur present.—In fact, not expecting from Dr. THOMSON's analysis, to find sulphur in the Nellore copper ore, I at first neglected the precautions necessary for its separation. This was accordingly effected on other samples, by boiling in strong nitric acid, which, from its heat, caused part of the sulphur in a pure state to rise in fused globules to the surface : while a portion, being oxygenated, was afterwards separated by precipitation with barytes.

The quantity of copper was most conveniently estimated from the black oxide taken up from the calx by dilute nitric acid. It was also obtained directly from other samples by reduction of the oxide with charcoal and borax.—The iron and pyrites were deduced from the difference between the residue in the cold solution, and that from the hot dissolution in strong acid of another parcel, before calcination.

Collecting together the results of the above operations, we have the following data, whence to deduce the composition of the three specimens.

	No. 1.	*No.* 2.	*No.* 3.
a. Loss of carbonic acid by digestion in dilute nitric acid, ...	12.0	14.6	7.0
b. Loss of water (and some carb. acid ?) by heating without air in a glass tube,.....	5.0	7.0	3.0
c. Total loss on calcination with access of air, ...	17.5	17.8	21.0
c 2. Ditto average of two other trials (more carbonate,)	20.0	20.3	23.5
d. Oxide of copper taken up from calx *c* by dilute acid,	37.7	49.2	73.7
e. Residue of insoluble earths and ox. iron, after *d*,	44.8	33.0	5.3*
f. Residue from digestion of crude ore in boiling nitric acid, ...	20.0	13.9	19.0
g. The same, after burning off the sulphur and redigesting in do.	20.0 ?	8.5	0.0
h. Sulphur, separated on boiling in strong acid, ...	0.6	2.1	9.0
i. Sulphate of barytes precipitated afterwards, ...	1.4	17.8	28.5
k. Weight of metallic copper actually recovered from *c* 2,	28.5	52.2	59.0

In regard to *d*, No. 3, it was observed on digestion in cold nitric acid, that a very considerable portion of the calx of copper was of a red color, or in the state of protoxide, or perhaps in a metallic state, and was not taken up without disengagement of nitrous gas ;—the weight 73.7 must therefore be increased, to give the true weight in terms of the peroxide. This is also proved by the amount of loss in *c*, 21.0, which is considerably in excess ; and it was remarked on removing the calx from the fire that it was agglutinated, so as per-

* This residue may have consisted partly of sulphuret of copper that had escaped decomposition in the fire ; for another specimen was wholly soluble, and little iron was present in the solution.

haps to have prevented the access of air to oxidate the interior.—The sulphur enables us to approximate the correction of this item; for 12.8 requires 51.5 copper,=64.3 black or peroxide; and this, added to 22.8, the peroxide of the carbonate, would give 87.7; which is 14.0 greater than the actual return from the fire.—Again, deducting the deficiency after calcination *(c.)* 21.0, from the sum of the three volatile ingredients—sulphur, 12.8; carbonic acid, 7.0; and water 3.0 =22.8, there remains but 1.8 for the weight of oxygen absorbed in place of the sulphur; whereas 12.8 are required.—Adding the difference 11.0 to *d*, we shall have 84.7. This number will be found to be a little in defect from the subsequent results; while 87.7 is a little too great; a mean may therefore be adopted.

From the above data, we may now proceed to extract the simple elements of each specimen of ore:

	No. 1.	*No.* 2.	*No.* 3.
l. Metallic copper, calculated from the oxide *d*, ...	30.2	39.5	69.0
m. Pure sulphur, from *h* and *i*, ...	0.8	4.5	12.8
n. Carbonic acid, less $\frac{1}{10}$th for hygrometric moisture,..	10.8	13.1	6.3

The carbonic acid being supposed to be wholly combined with copper, while the sulphur may be partly united with iron, we may calculate the proportions of the carbonates and sulphurets by means of the scale of chemical equivalents, thus:

	No. 1.	*No.* 2.	*No.* 3.
o. The carbonic acid will require copper, ...	31·4	38·6	18·3

Now in the first two of these, the copper required so nearly agrees with the calculated weight of metal, *l*, that the latter may be looked upon as existing here wholly in the form of carbonate, and the sulphur as united entirely with iron*. In No. 3, however, we find that the majority of the copper remains; and knowing the nearly total absence of iron in this specimen, we may conclude it to be a mixture of nearly two parts sulphuret, with one of carbonate.

The miner would rest content with the determination of the pure metal in the ore, and would have good reason to be satisfied with the 60 per cent. "actual yield" of No. 3, or even with the 30 per cent. of the poorest of the three ores; but the mineralogist will prefer an exhibition of the component salts of the ores, according to the usual synthetical formula. I may here remark, that the water separated (*b*) is more than is required to convert the carbonate into a hydrate or ordinary malachite: thus,

* In the second Analysis of No. 2, however, the copper actually recovered, *k*, so much exceeds this quantity, that it is evident this ore frequently contains sulphuret, or is of very variable quality.

		No. 1.	*No.* 2.	*No.* 3.
p.	The copper combined with carbonic acid being, ..	30·2	39·5	18·3
q.	will require water to hydrate it, ...	4·2	5·5	2·6

The excess in *b* may have been carbonic acid, partially driven off.

The chemical composition of the three minerals may therefore be thus expressed:

	No. 1.	*No.* 2.	*No.* 3.
Hydrated carbonate of copper, ...	52·4	68·5	31·7
Sulphuret of copper, ...	0·	0·?	63·0
Sulphuret of iron, ...	2·1	12·4	0·0
Oxide of iron, silex, &c.....	43·5	25·1	5·3
Loss or excess, ...	2·0	—6·0	0·0
	100·0	100·0	100·0

The excess in No. 2, is doubtless owing to the irregularity of the rocky admixture in different specimens, whereof one yielded 44, and another only 13·9 of insoluble matter, on digestion in acid.

The richness of the last of the three minerals will more than compensate for the increase of trouble and expence in the reduction of the ore by successive roastings; and practical miners assert, that the glance or grey sulphuret is a much steadier and more plentiful ore than the carbonate.

I should add, before concluding the above imperfect analysis of the Nellore copper ores, that I tested them in vain for silver and other metals. Neither did arsenic appear to be present.

I may here mention, that among the specimens of minerals presented to me by Mr. Kerr, as occurring within the copper mining district, associated with the micaceous schist, are the following; corundum and adamantine spar, garnets, dark-green actinolite, red chalk, manganese; besides carbonate of magnesia, and other minerals of which specimens have not yet reached me. An ore of mercury is also suspected to exist in the same range of rocks. The surface of the gneiss or micaceous schist, where exposed to the air, is frequently seen tinged of a green colour, from the trickling of water holding carbonate of copper in solution, through crevices of the rock.

Copper Mines of Singhána, in the Shekáwatí country.

I take this opportunity of acknowledging the receipt of further specimens of the ores of these mines from Colonel Stacy.—They consist of the yellow and grey sulphurets, carbonates, and the blue native sulphate in deliquescent crystals. The latter is probably produced from the pyrites; as is the sulphate of iron from its sulphuret. Both of these occur also at Singhána: the sulphate, from its different tints, having the native names of *píla* and *hara kasís*, or yellow and green vitriol. There is also among the specimens a *mungya*

kasís, which appears to be a compound of alum, and the sulphates of iron, and copper. There are two very beautiful specimens of virgin copper in mammellated concretions, coating oxide of iron, which appear to have been formed by a natural decomposition of the blue soluble sulphate on coming in contact with the iron ore.

A full description of the Singhána mines, and the mode of extracting and working up the ore, (by Captain Boileau, of the Engineers?) is printed in the third volume of the Gleanings in Science, page 380. It does not appear from that notice, that any previous roasting of the ore is resorted to; but instead of this process, the ore is ground to a fine powder, formed into cakes with cow-dung, then burnt in a "clamp," and lastly, mixed with scoria of iron to be blasted. The iron in this operation, deoxidated by the charcoal, doubtless assists in removing the sulphur from the copper by its superior affinity. The metal produced from these mines is, however, not thoroughly refined; but according to Captain Boileau, is brittle, and of a lilac colour: while that of *Basáwar* in the *Bhartpur* district, (most probably a carbonate) is at once melted down into a fine malleable metal—but on the other hand, the latter is too poor an ore to be worked profitably.

The extent to which the *Shekáwatí* mines have been worked in former ages of Hindu prosperity is fully equal to that we have seen of the *Nellore* mines, and strikingly similar in every respect. "The scoriæ, or *khangar*, that have been accumulating for ages, have at length formed a line of small hills, several hundred feet in length, and from thirty to sixty feet high: there are four insulated stone bastions built on ore of these artificial mounds. The rocky ridge in which the excavations have been carried on for generations is pierced by numerous shafts, giving access to the galleries, by which the hills are honey-combed in every direction to the length of a *kos*, if the natives are to be believed." But I must refer to the article whence these paragraphs are quoted; for the whole account will be read with interest.

I am in expectation of further specimens of the *Shekáwatí* minerals from Mr, Dean.

Ajmír Copper Mines.

A new locality of copper ore has recently been brought to notice by Captain C. J. Dixon, in the neighbourhood of *Ajmír*, where three different shafts have been opened. Specimens of the ore extracted thence were forwarded to me by the present Governor General, along with a copy of the report from Captain Dixon, on the subject, dated 8th May, 1835, from which I extract the following particulars:

"The *Ajmír* ore in mineralogical phraseology is 'termed a ferrugenous red oxide of copper,' and being free from sulphur, two operations are sufficient to metallize it; one smelting, and one refining. The ore in *Shekáwatí*, as well as the principal ores worked in Cornwall and Wales, are sulphurets, copper pyrites. They require successive calcinations, roastings, and smeltings; eight separate processes being essential to perfect metalisation. At the same time, that our operations are conducted with celerity, and consequently at a comparatively small outlay; inasmuch, that the ore, on the third day after it has been dug from the vein, is reduced to a metallic state, adapted for sale; (while in Europe calcination alone occupies several months,) the business of smelting is wholly free from that noisomeness, so injurious to health, which characterises works of this nature at home, when sulphur forms an ingredient in the chemical composition of the ore.

"The first vein was opened near *Gúgra*, four miles N. N. East of *Ajmír*. It runs north and south, and its breadth varies from a span to four inches. It is situated on the plain, within one hundred and fifty yards from the range of hills; its greatest depth being sixty feet from the surface. An admixture of ores from separate veins is essential to a complete fusion; and with this intention, a vein was sought and opened at *Rájgarh*, twelve miles S. S. West of this. This vein, also on the plain, but near the hills, is only twenty-five feet from the surface, while a third has been opened, within the last fifteen days, near *Rajáurí*, ten miles south of *Ajmír*. The presence of copper has been detected at other spots: indeed, it is beyond doubt the whole of the *Ajmír* valley is traversed by veins, which run from *Kishengarh* to *Rájgarh*, a distance of thirty miles; industry and capital being the sole requisite to their complete development. In Cornwall, good veins are not met with, until attaining a depth of three hundred feet and upwards. At present, our labours are confined almost to the surface. The transmission of these specimens will, I hope, prove so far useful, that should the Honorable the Governor General be pleased to make them over for analyzation to some scientific gentleman in Calcutta, their intrinsic value as ores will be ascertained; for though the studies of the laboratory be as widely different in their issues from the labors of the furnace, as theory is from practice, still a favorable result in the former will be highly satisfactory, and may at a future period warrant the establishment of the works on a large scale. In exemplification of the observation in reference to theory and practice, various specimens treated in the study yield from twenty to eighty per cent., while the average produce of the mines in Cornwall for some years past has ranged from eight and a quarter to

ten per cent. of metal. The reason is obvious. In the small way, assorted specimens are selected, and by proper care and attention to their treatment, every particle of metal is recovered. But in the large way, in the smelting furnace, rich and poor ores with a good deal of extraneous matter incorporated therewith are fused together. Hence the result of the furnace always falls short of the issue of experiments in the study."

Captain Dixon is quite correct as to the fallacy of trusting to the results of the laboratory in regard to the average produce of mining operations. The nature of the ore, and of its associated minerals, is all that the chemist can pronounce upon. In this respect, the *Ajmír* ores, like those of *Bhartpur*, hardly offer much encouragement: none of the specimens, small as they are, consist of homogeneous ore, but are in general, merely coatings of carbonate on a ferruginous matrix, or veins in quartz and a micaceous schist. It is probable, however, that small cabinet specimens would be selected for this very object of shewing the connection with other rocks, and that far richer lumps are taken to the smelting house.

The ore from *Rájgarh*, twelve miles S. S. W. of *Ajmír*, is accompanied with slender prismatic crystals of selenite, of black augite, hydrated red oxide of iron, and carbonate of the same metal. There are also veins of an aluminous or silicious malachite, which may be termed *turquoise copper ore*; it is of a fine blue colour, translucent where thin, breaking with conchoidal fracture, and apparently capable of being converted to ornamental uses. It differs from the turquoise*, in being insoluble in acids, which take up only the green colouring matter, a carbonate of copper. I have not further analysed this curious mineral. At *Rájauri*, ten miles S. W. of *Ajmír*, the carbonate is of a lighter colour, more earthy, and accompanied with small yellow scales of mica and iron. At *Gúgra*, four miles N. N. E. of *Ajmír*, the malachite is associated with carbonate of lead, a micaceous carbonate of iron, and with a rich galena or sulphuret of lead. Yellow copper pyrites also shews itself, and earthy veins of a pale blue, very similar to some of the streaks in the turquoise rocks of Nishapur, in Persia. It is possible that this mineral itself might be met with, on farther search, if felspar or other aluminous minerals exist in the *Ajmír* hills: the matrix of the turquoise is also a red iron clay ore, very similar to that of the copper mines.

* See analysis of this mineral in the *Gleanings in Science*, ii. 375.

VIII.—*Proceedings of the Asiatic Society.*

Wednseday Evening, the 4th November, 1835.

Captain PEMBERTON, Senior Member present, in the chair.

The Hon'ble Sir BENJAMIN MALKIN, Kt., and CHARLES HAY CAMERON, Esq., proposed at the last meeting, were ballotted for, and unanimously elected Members of the Society.

Read a letter from Lieut. W. C. BAKER, acknowledging his election as a member.

Read a letter from THOMAS DICKENSON, Esq., Secretary Bombay Branch of the Royal Asiatic Society, acknowledging the receipt of a copy of the Index to the Asiatic Researches.

Read a letter from CHARLES KONIG, Esq. Foreign Secretary to the Royal Society of London, acknowledging the receipt of a copy of M. CSOMA DE KÖRÖS's Tibetan Grammar and Dictionary.

Library.

The following books were presented:

Proceedings of the Geological Society of London, No. 39—*by the Society.*

Madras Journal of Literature and Science, No. 9, October 1835—*by the Madras Literary Society.*

A Treatise on the manufacture of Saltpetre, descriptive of the operations and proper plans to be used for the manufacture of Culmee and Cooteah—*by Mr. J. Stephenson, and presented by him.*

The Indian Journal of Medical Science, No. 23—*by the Editors.*

Meteorological Register for September, 1835—*by the Surveyor General.*

The following books were received from the Oriental Translation Fund:

The Chronicles of Rabbi Joseph Ben Joshua Ben Meir, the Sphardi. Translated from the Hebrew *by C. H. F. Bialloblotzky,* vol. I.

Miscellaneous Translations from Oriental languages, vol. 2nd.

Les Aventures De Kamrup, par M. Garcin De Tassy.

Harivansa, or Histoire de la Famille de Hari, part 1st—*by M. A. Langlois.*

Ethiopic Didascalia, or the Ethiopic version of the Apostolic Constitutions received in the Church of Abyssinia, with an English translation—*by Thomas Pell Plat, Esq., F. A. S.*

Nipon o Dai itsi Ran, ou Annales des Empereurs du Japon, 1 vol.—*by M. J. Klaproth.*

Lardner's Cabinet Cyclopedia, Swainson's Animals.

A piece of ancient Hindu Sculpture, representing a female (goddess), with a child, walking, dug up in the ruins of Canouj, was presented by Colonel STACY.

Literary.

Read a letter from W. H. MACNAGHTEN, Esq., Secretary to Government, Political Department, forwarding on behalf of the Honorable the Governor General of India in Council, a copy of notes taken by Captain WADE, relative to the territory of Iskardoh, and of his correspondence with the ruler of that country.

A memoir on the mountain tribes, on the extreme N. E. frontier of Bengal, by J. McCOSH, Civil Assistant Surgeon at Goalparah—*presented by the Author.*

Extracts from both these papers were read.

Physical.

The following extract of a private letter from Captain CAUTLEY to the Secretary was read, noticing the discovery of further fossils in vast quantity in the Sewálik range.

"A trip to the Sewáliks, near the Pinjore valley, lately, has introduced us to the *Anoplotherium ?** in a perfect line of six molars on one side, and four ditto in the other side of upper jaw. I say *Anoplotherium*, for the rear molars have the distinguishing mark in the insulated mamilla pointed out by CUVIER†, as that which distinguishes the Anoplotherium from the Palæotherium, although the position of the molar bone, part of which is distinguishable, appears to differ from that of the former animal, and gives it a greater resemblance to the Palæotherium; this is a beautiful fossil, and *dug out:* but I must give you a history of the last week.

"I had to visit Dádupur on canal matters, and found both BAKER and DURAND as eager as myself for a short excursion into the Sewáliks; and as all our parties were out, we determined on visiting those most westerly, who were working at a village called Moginund (a common name apparently) in the Ramgurh district, about 50 miles W. of Dádupur: our route took us through Sidaura, Naraingurh, Mír ká Gurhi, Ramgurh, to the village of Moginund, which lies in a nook of these little hills, open only on the west: here we remained three days, returning to Dádupur by regular marches, and visiting Khet Púrali, another little, village close under the hills on our way, as near this village is a stratum of a clay conglomerate, or marl full of testaceous remains chiefly Bivalves (varieties of Unio,) reptiles, and fish; of the former, you have already specimens, and with the latter, you shall be provided in due course. The country on this route was open and well cultivated, rice in great abundance, and cultivation of all sorts up to the foot of the hills. These hills differ much in appearance from those between the Jamna and Ganges; the abruptly scarped precipices, and mural cliffs, with the huge strata of shingle, are here replaced by a comparatively low series of undulating hills, consisting of an eternal succession of sands and clays, with here and there beds of a coarse sandstone, or fine shingle conglomerate, accessible at all points excepting those where slips have taken place, and free from jungle and high vegetation, excepting in hollows, and the lines of ravines skirting the tributaries to the main outlets of drainage.

"The hills were covered with fossils like all the others (how they could have escaped observation before, must remain a source of wonder). Mastodons and hippopotamus's remains looking one in the face at every step! Amongst the remains collected were those of the *rat* and *porcupine*, too perfect to admit of any doubt. The specimens of each consisting of the *palate*, with the two lines of *molars!!!* Although three days at this place, and superintending my digging parties, I must confess my inability to decide strictly whether we were working in a *stratum* or in *debris:* this may appear strange to a person who has been unaccustomed to examine and decide on the position of strata, but will be understood and appreciated I imagine by any one who has had his attention strictly brought to bear upon the point. Shrubs, inequalities of surface, ravines, et hoc genus omne, all and each of them battling every inch! I am however inclined to consider that we had both, and that we were working in both a soft sandstone stratum, and also in a superficial coating of debris. A great number of perfect bones, the whole series of a leg for instance, jaw bones, and other remains were fairly found and dug out from the rock; at other places, huge masses of hard rock were found imbedded in the softer rock or soil, the said masses consisting in most cases of agglutinated bones: the shape of these masses give an appearance of their having fallen *formerly* from some parent rock, and being *now* found as debris; but the circumstance of finding the connected joints of animals is altogether in favor of the excavation being in the stratum in which they were originally deposited. The question does not appear to me of much consequence, as the bones are not rounded by attrition, and are as sharp and perfect in their form and outline, as when belonging to the living animal, although frequently broken, and jammed together, as would be the case in a skeleton or a mass of bones being forced together in an upheavement of the country upon which or in which they were collected.

"I may remark that our excavation was not on the outcrop of the strata, but in the slope, and the working parties were successful in their operations at many points on the whole surface of that side of the mountain. This deposit appears to be altogether wanting in the mastodons, reptiles, and hippopotami: the remains at present dug out consist of portions of anoplotherium or palæotherium, rhinoceros, hog, horse, ruminants of the most gigantic dimensions, with those of the smaller classes, carnivora, hyæna, canis, tiger (or lion), and a small species of a feline animal, a very perfect cranium of which is in the possession of Lieuts. DURAND and BAKER. Many

* This fossil is either the Anoplotherium, or a new variety of the Palæotherium, and if it was not for the insulated mamilla, referred to, its classification amongst the latter genera would, I suspect, be undoubtedly correct. The discovery of more perfect remains of the head, will settle this point at once.

† Volume iii. p. 21. Ossemens fossiles.

of the bones of these animals are coming out perfect, and some have been found, as I before mentioned, in connected joints!

"With reference to the Sivatherium, I regretted much my inability to obtain the dimensions of one of the most superb fossils, I suppose that ever was found; it was unfortunately discovered and excavated by a party of work-people employed by a gentleman with whom I was unacquainted, and although I saw the fossil when in the rock, I was prevented from getting the measurements afterwards. This specimen consisted of the femur and tibia, with the tarsal, metatarsal, and phalanges of one of these gigantic ruminants that time and patience will and must introduce us to! In the bones of all the animals discovered, there are differences from those of their existing congeners that will be pointed out hereafter; it may be sufficient here to advert to the fact. The teeth that are found at this spot are beautifully perfect, and from the softness of the matrix or rock in which they are imbedded, easily cleared and exhibited. There is an evident grouping of animals throughout! The hippopotami, mastodons, &c. which in some localities are in such abundance, are in others wanting; their place being occupied by carnivora, ruminants, &c. The testaceous remains as yet found have been accompanied by reptiles and fish. We have in fact an extended tract of country upheaved, and the different groups as might be expected in their natural habitats!! It is hardly a month since I attempted, in a note on the Gavial of these hills, to enumerate the probable proportions of animals that existed on this tract! During this short period, we have added another family, Rodentia, to our catalogue, and another genus of the Pachydermata, besides the splendid additions to our former list in the further elucidation of those already found, in the discovery of more perfect specimens of bone, especially of the horse, rhinoceros, and the larger ruminants!! You will join with me in an exclamation, which has been upon my lips, day after day, since the discovery of the first fragment of bone—'*What shall we have next?*'"

1. A small, but splendid, collection of stuffed birds, presented by Captain PEMBERTON.

As they were received only the same morning, the Curator deferred his report until the next meeting.

2. A species of *Pteromys*, presented by Captain DAVIDSON, from Goalparah, Assam.

3. A collection of Mammalia and Birds from Goalparah, Assam, presented by Dr. McCOSH. The collection consists of the following specimens:

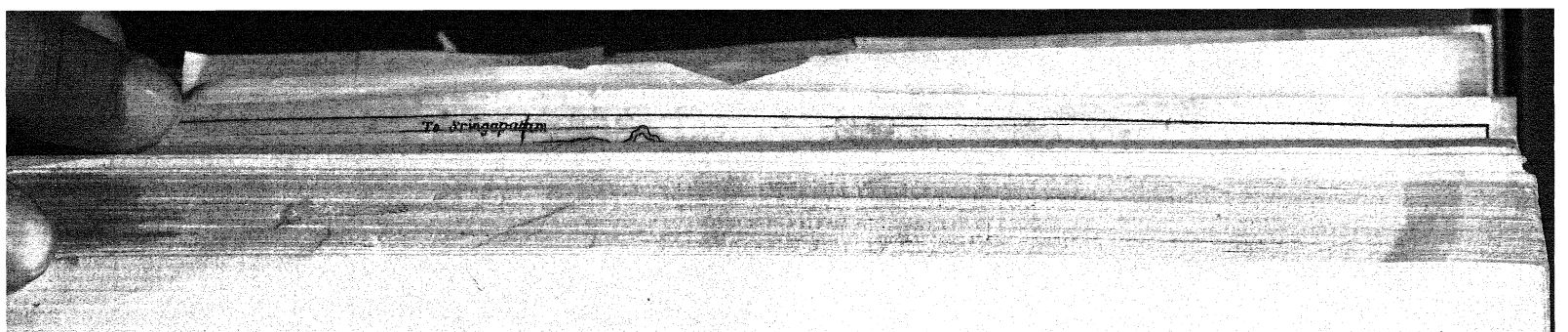
Mammalia.

1.—*Mungusta Mongoz.*
2.—*Pteromys.*
3.—*Moschus Memina.*
4.—*Moschus Memina*—(Skeleton).

Birds.

1.—*Alcedo Bengalensis.*
2.—*Dicrurus Cœrulescens.*
3.—*Turdus Saluaris.*
4.—*Oriolus Melanocephalus.*
5.—*Eudynamys Orientalis.*
6.—*Buceros Homrai.*
7.—*Buceros Malabaricus.*
8.—*Garrulus Bengalensis.*
9.—*Polypleitron Hardwickii.*
10.—*Phasianus Gallus*—2 male and 1 female specimens.
11.—*Phasianus Lineatus.*
12.—*Gallinale Porphyris.*
13.—*Fuligula Caryophyllacea.*

The *Buceros Homrai* is considerably larger than the one described by Mr. HODGSON in the 2nd part, 18th vol. Researches of the Asiatic Society. From tip of the bill to tip of the tail, Dr. McCOSH's specimen measures five feet two inches; that of Mr. HODGSON's is only four feet 5½ inches in length: and by comparing the bill and casque with two of the Nipal bird, in the cabinet of the Curator, the inferior size of the latter is very apparent. There is, belonging to Captain PEMBERTON, a specimen now upon the table, of the bill and casque of the same bird, from Chittagong, even larger in size than that from Assam.—CUR.



Meteorological Register, kept at the Assay Office, Calcutta, for the Month of October, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Ags. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Ags. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	29,849			87,5	7,7			,733			92,4	12,6			79,5	122,0		o.	N.	o.	clear.	clear.	
2	,807			87,0	9,6			,690			93,8	16,3			78,8	127,8		W.	n.	W.	do	do	do
3	,775			86,3	9,0			,679			91,5	15,2			78,2	120,2		nw.	n.	o.	do	do	cum. str.
4	,838			85,5	7,3			,769			82,4	6,0			77,8	108,9		e.	e.	S.	cum.	cum.	squall s.
5	,883	28,692	1,191	83,5	4,4	4,9	95	,769	,547	1,222	85,5	4,9	5,2	94	76,6	111,1		e.	e.	se.	do	do	nimbus.
6	,856	,647	1,209	85,3	5,1	4,6	95	,758	,589	,169	84,6	6,2	5,4	93	76,0	113,6	,25	e.	se.	n.	do	do	showery.
7	,842	,686	1,156	84,1	3,6	3,6	97	,716	,494	,219	85,3	5,4	5,2	95	75,2	123,2		o.	W.	e.	c. c.	do	cumuli.
8	,834	,648	1,186	84,5	5,2	5,2	93	,714	,498	,216	85,5	7,4	7,9	86	75,8	123,2		n.	NE.	ne.	clear.	do	fine.
9	,838	,646	1,182	84,5	7,2	7,4	87	,714	,496	,218	85,9	12,1	12,1	73	74,0	125,5		nw.	NW.	N.	do	fine.	clear.
10	,796	,629	1,167	84,1	8,8	8,7	85	,712	,408	,304	86,7	12,0	11,7	76	74,2	119,5		sw.	W.	W.	do	fair.	fair.
11	,847			83,0	9,7		87	,751			85,2	16,6			74,0	130,0		nw.	nw.	o.	fog.	clear.	do
12	,892	,696	1,194	84,7	7,2	7,7	87	,778	,540	,238	86,0	8,1	8,3	85	73,5	128,2		nw.	NW.	nw.	do	fine.	clear.
13	,836	,638	1,198	84,8	6,9	6,7	89	,722	,472	,250	86,3	8,7	9,6	83	74,2	125,0		wnw.	NW.	w.	do	do	fine.
14	,816	,584	1,232	85,8	6,8	7,3	88	,680	,402	,278	87,3	9,0		76	78,8	115,2	,60	ne.	ne.	ne.	do	do	do
15	,780	,558	1,222	85,7	5,8	5,6	94	,676	,397	,279	87,0	7,0	6,2	93	76,0	114,0	,25	E.	ne.	e.	cir.	hazy.	threatning.
16	,734	,496	1,238	85,6	5,8	5,1	94	,625	,312	,313	87,7	8,0	8,3	87	75,1	111,2		E.	e.	e.	hazy.	overcast.	do
17	,719	,470	1,249	86,1	6,5	5,4	93	,622	,396	,226	86,7	7,4	6,4	91	77,3	112,1	,65	E.	ne.	nw.	do	cumuli.	rain.
18	,744			83,5	5,1			,670			82,0	7,2		96	76,2	86,4		o.	o.	n.	cum. cir.	clear.	hard storm.
19	,722	,642	1,080	82,0	4,5	4,4	96	,640	,470	,170	84,4	5,2	4,6	96	72,0	87,5	3,30	SE.	SE.	se.	rain.	overcast.	gathering.
20	,738	,636	1,102	82,6	3,6	3,0	98	,634	,428	,213	85,4	6,6	5,8	93	70,0	98,2	,10	s.	sw.	sw.	cumuli.	do	cumuli.
21	,732			80,4	5,4			,633			81,3	5,4			75,6	110,5		S.	E.	e.	cum. str.	cum.	rainy.
22	,729			81,3	4,3			,632			83,0	3,1			75,7	116,2	,05	o.	N.	o.	fair.	do	cloudy.
23	,781			79,5	3,6			,696			82,0	3,3			75,0	107,5	,75	N.	N.	n.	cum. str.	rain.	strati.
24	,826	,697	1,128	82,7	3,8	3,8	98	,704	,572	,132	83,7	6,0	5,0	93	75,4	119,5		o.	NW.	nw.	cir. cum.	fine.	fine.
25	,883			80,0	9,4										75,0	113,7		N.	N.	nw.	fair.	cum.	do
26	,927	,846	1,071	80,9	8,9	9,3	80	,827	,697	,130	82,5	10,8	9,5	81	68,7	120,6		NW.	N.	nw.	clear.	cum. str.	do
27	,939	,898	1,041	80,2	9,0	8,0	85	,822	,698	,124	82,3	9,7	8,7	83	68,5	120,5		NW.	N.	nw.	do	cum. cir.	do
28	,919	,874	1,045	80,1	8,3	8,0	86	,798	,676	,122	82,4	11,1	10,1	81	67,6	126,5		NW.	NW.	nw.	do	fine.	fair.
29	,894	,836	1,058	80,6	9,0	8,7	83	,808	,697	,111	82,3	11,1	10,0	79	68,4	126,2		NW.	NW.	nw.	do	fair.	do
30	,908			78,5	11,0			,791			81,2	12,3			70,3	124,0		N.	N.	N.	do	do	cum.
31	,911			79,5	10,3			,799			81,5	15,5			74,0	127,6		N.	N.	N.	do	hazy.	hazy
Mean,	29,826	28,680	1,155	83,3	6,8	6,2	91	,707	,515	1,207	85,1	9,3	7,7	86	74,4	117,0	5,95	North monsoon set in.			One storm on the 18th.		

Instruments the same and placed as usual.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 47.—November, 1835.

I.—*Notes taken by Captain* C. M. WADE, *Political Agent at Ludiána, in* 1829, *relative to the Territory and Government of Iskárdoh, from information given by* CHARÁGH ALI, *an agent who was deputed to him in that year by* AHMAD SHÁH, *the Gelpo or ruler of that country.*

[Read at the Meeting of the 4th November.]

[In publishing the accompanying memoir, we have purposely not availed ourselves of the permission given us by the author, to omit the copies of his correspondence with the Gelpo of *Iskárdoh*, because the dates of these letters establish the fact of Captain WADE's attention having been drawn to the traditionary history of this place in 1829, previous to the information acquired in Lieut. BURNES' travels that appeared in our second volume. In 1831, Captain WADE urged M. JAQUEMONT to push his way into little Tibet, as may be seen by a remark in his letters, and the deputation from the ruler of *Iskárdoh* therein described, consisted of the same individuals whom our author interrogated at *Ludiána*. Mr. VIGNE, an English traveller, is now on his way to little Tibet, and will doubtless clear up the important question suggested to the native ruler by MOORCROFT, whose own papers probably contain some speculations on the subject. (See also CSOMA DE KÖRÖS's note on the geography of Tibet, J. A. S. vol. i. 121, and BURNES' note, ii. 306.)—ED.]

PRELIMINARY CORRESPONDENCE.

From AHMAD SHA'H, *the Gelpo or ruler of Iskárdoh (capital of little Tibet), to Captain* C. M. WADE, *Political agent at Ludiána.*

After Compliments,

Sometime ago Mr. MOORCROFT came towards my country*, and by his friendly disposition and great kindness, sowed the seeds of a lasting friendship in my heart.

Adverting to the general rule and practice which the English observe of making a friend of every stranger, and that, please God, they will never alienate themselves from one with whom they are already connected; on hearing the news of your auspicious approach (Captain WADE's first mission to the Panjáb in 1827, from Earl AMHERST, the Governor General of India,) I wrote to you and sent you a message; but my letter was intercepted on the way by my enemies, and prevented from reaching ite destination†.

* Mr. MOORCROFT opened a correspondence with AHMAD SHA'H from Ladákh, but did not visit Iskárdoh.

† The letter of which a translation is now given was brought by way of Kolu. It was folded in the size and shape of a rupee, and was enclosed in a piece of leather and worn as an armlet to elude discovery; the Sikhs and the people of Ladákh both

Several letters addressed to me by Mr. MOORCROFT, are in my possession, and I bear his communications in my mind. I would send you one of his letters, but I regard them as sacred relics, and do not like to part with any one of them, lest it might fall into the hands of malevolent enemies on the way. The following is a passage from one of the letters which I received from him: "It is supposed that ALEXANDER the GREAT came to Iskandariá, and that some vestige of him is still to be found there. In that event, is it in the form of arms or weapons, or books; and if books, are they in the Persian or Grecian language*." He gave me at the same time some kind and considerate counsels. I was not then aware of any vestiges, and Mr. MOORCROFT departed on his journey. After some research I have ascertained that there is a part of the foundation of an old dilapidated fort, which was destroyed by fire. If there should be any thing, it will probably be found beneath these ruins. God knows. Let me recommend you therefore to depute an intelligent gentleman of your own tribe, who will be able to satisfy himself by personal inquiry on every subject, as well as on the existence or otherwise of the Macedonian relics that are supposed to be here.

There was a report, that Mr. MOORCROFT was desirous of finding a way to Yarqand; but his scheme was frustrated by the intrigues of the people of Ladakh. If you have the same design, there is a passage to Yarqand through my country, which is available to you if you please. Consider my humble roof as your own.

Do not fail to despatch some one on your part. I am anxiously waiting to receive him. Although it is like the ant preferring a petition to SOLAIMAN, there is no impropriety in making an application, and I trust that you will not withdraw your hand from the request of the petitioner.

I suspect that some vestiges of ALEXANDER the GREAT are likely to be discovered beneath the foundation; but God knows whether there are any or not.

From Captain WADE *to* AHMAD SHA'H, *dated the 22nd of August*, 1829.

After Compliments,

I have been delighted by the receipt of your friendly letter, transmitted by the hand of CHARA'GH ALI SHA'H, your agent. The perusal of it afforded me the highest gratification in the glad tidings that it conveyed of your health and happiness. What you write regarding the journey of Mr. MOORCROFT in your direction, and that he cultivated amicable relations with you, is very intelligible. It is the duty of the officers of the British Government to consider those who are well affected towards them as their sincere friends, and to attach them by daily increasing ties of unity and friendship.

As I have been engaged on a journey (to Delhi), the dismission of your agent has been delayed. I now take the first opportunity of giving him his leave to return. On his arrival in your presence, he will communicate to you the sentiments of esteem and regard which you have established in my heart.

Considering me among your well wishers, continue to delight me often by the receipt of your friendly letters.

From AHMAD SHA'H *to Captain* WADE.

After Compliments,

Praise be to God, that by the blessing of his infinite favour, the garden of friendship and unity, watered by his mercy and bounty, is blooming between us, loaded with fragrance and joy.

I offer thanks to the Almighty, that I have had the pleasure to receive your propitious letter by the arrival of my agent CHARA'GH ALI; adverting to the gratifying expressions contained in it, that, it is the rule of the British nation

being supposed to be jealous of the writer's design. There is enmity between AHMAD SHA'H and the chief of Ladákh, and the presence of the Sikhs in Kashmír renders it difficult to maintain a communication by that route without their knowledge.

* AHMAD SHA'H'S agent informed me, that there was a book in his master's possession in a character which no one could read. He described it to be bound in a clasp cover. It is probable, that this book is a Latin Bible, left by some of the Jesuits who visited this part of Asia in the 15th century, and not of any Grecian origin.

to cultivate relations of friendship, and make friends of strangers, and never to alienate themselves from their friends; thank God, that my wish is gratified.

CHARA'GH ALI has delivered to me your message, that you were desirous of receiving intelligence from this quarter as well as of the state of affairs in the neighbouring countries. Immediately on his arrival, I sent one of my people to collect information; but unhappily, he had scarcely reached the midway of his destination, which is two months journey from hence, before he died. I forthwith despatched another person; but he has not yet returned. In consequence I have postponed CHARA'GH ALI's departure to you until his return. If the man whom I have sent come back before the snow begins to fall, CHARA'GH ALI will soon have the honor of presenting himself before you; but if, God forbid, he should not have returned when the winter has commenced, and the road becomes impassible, I will still depute CHARA'GH ALI to you with intelligence of such passing events as may come to my knowledge*.

I have nothing more to add than to express my hope, that you will not forget to gratify me constantly by tidings of your welfare.

From Captain WADE *to* AHMAD SHA'H, *dated the 8th of Feb.* 1831.

After Compliments,

The receipt of your friendly letter, at a time when I was very anxious to hear from you, has delighted me beyond measure, and the news which it contained of your health and happiness have afforded me the highest gratification.

I am rejoiced to learn, that you have sent a person to collect intelligence regarding the state of affairs in your quarter, and your intention of communicating the result to me by the hand of CHARA'GH ALI, when your messenger should return. These friendly offices bear ample testimony to your good will towards the British nation. I expect that ere now you will have despatched your agent with intelligence from that quarter. It is evident that there is nothing in the world more exalted than friendship, for the peace and good order of the affairs of mankind depend on it. When its benign influence reigns between different nations, it is especially productive of mutual advantages.

Regard me among your sincere friends, and gratify me often by your friendly communications, as they are a source of great delight to my mind.

From AHMAD SHA'H *to Captain* WADE.

After Compliments,

Praise be to God, that through his blessing, affairs in this quarter at the present date are in a satisfactory state. The mirror of my heart is soiled with no care but the desire of an interview with you, which by the divine favour I hope will soon take place. May success and prosperity attend your tribe.

It must not be concealed, that from the beginning I have been moved by an anxiety beyond bounds to connect myself with the well-wishers and faithful servants of your Government, by ties of friendship, and to identify myself without reserve with their interests. My mind was occupied with these thoughts when Mr. MOORCROFT happily came and resided in my vicinity (Ladákh), where he was delayed for a time from a cause which I have heard, but do not exactly know the secret of the affair. At that period he opened a cordial communication with me by the interchange of friendly letters; after which, I had no opportunity of gratifying my heart's desire. I then despatched CHARA'GH ALI with a letter to you, and had the pleasure to receive one in reply. Although my agent was engaged to return to you soon, his departure has been delayed owing to a circumstance which the bearer will explain. Since that time, I have written several letters successively to you, which do not appear to have reached their destination.

Mean while, M. JAQUEMONT came to Kashmír, and renewed the friendly sentiments which posesssed my heart. I deputed CHARA'GH ALI and another person named NA'ZIM to him, and had the gratification of cultivating through them the

* With the present letter I received a separate paper, containing an account of the recurrence of the insurrection in Eastern Turkistán, which I forwarded at the time to the Secretary to the Governor General, who had received information of the event from the Select Committee at Canton, and was desirous of receiving any intelligence that I might have on the subject.

seeds of friendship with that gentleman. I afterwards addressed several letters to him, which with the exception of one which I despatched by the hand of a man MOHAMDU by name, and to which I had the pleasure to receive a reply, failed to reach him. Since that period, notwithstanding every exertion on my part, I have not been able to renew my correspondence with him.

I have now the felicity to despatch NA'ZIM to you, who, please God, will, on his arrival, mention to you in person every thing connected with me and my affairs. My object is to request that you will depute a confidential agent to me, that I may entrust to him some secrets which I wish to impart. Although the application of an humble individual is considered forward and presumptuous, yet recollecting your kindness, and the reputation which you enjoy with the world for your friendly disposition, I have taken the liberty of communicating my wish to you, and I hope that it will be deemed deserving your consideration, that both parties may be reciprocally benefitted.

From Captain WADE *to* AHMAD SHA'H, *dated the 22nd of February*, 1834.

After Compliments,

I have been gratified by the receipt of your kind letter at an auspicious moment, when my thoughts were directed towards you. Its arrival has expanded my heart with joy, as it assured me of your health and welfare.

The communications with which you charged your servant NA'ZIM have been delivered to me. What you wrote regarding the feelings of attachment and regard by which you are moved towards my countrymen, I can well appreciate. The fact is, there is nothing more valuable or estimable in the world than friendship, tending as it does to promote the peace and prosperity of mankind. It is particularly conducive to their welfare, when its fruitful influence prevails between different nations. The British Government has a due regard for every one with whom it has any amicable relations. I, as well as the Government which I serve, are aware of your sentiments of attachment and friendship; but as I cannot properly depute a person on my own part, nor answer your questions without the permission of my Government, and the Right Honorable the Governor General happens at present to be absent on a distant journey (at Utacamund), and the hot season is rapidly approaching, I do not consider it advisable to detain NA'ZIM with me, until I can get a reply from His Lordship. I have therefore dismissed him on his return. He will communicate to you the sincere regard which I entertain for you, while I inform my Government of the contents of your letter, and will let you know hereafter what reply I receive.

Considering me among your sincere friends, continue to gratify me frequently by the receipt of your welcome letters.

Situation.—Iskardoh is a mountainous country, divided into valleys of various extent. It is situated towards the point where the *Belat Ták* and *Mus Ták* mountains converge and separate the lofty ledges of *Tibet*, from the plains and valleys of *Turkistán*: among the natives it is generally known by the name of *Beldestán*.

Tradition.—The tradition is, that ALEXANDER the GREAT came here on an expedition towards *Khatá* or Scythia (modern China), and that the *Koteli Musták*, or the *Musták* mountains, which lie between *Yárqand* and *Khatá*, being at that time impassable, on account of the depth and severity of the snow, the Macedonian halted on the present site of the capital, until a road could be cleared for his passage; when, leaving every part of his superfluous baggage, together with the sick, old, and infirm of his troops behind, in a fort which he erected while there, he advanced against *Khatá*. These relics of the army founded a city, which they named *Iskandariá*, or *Alexandria*, now pronounced *Iskárdoh*.

Extent.—In length, the territory of *Iskárdoh* is estimated to be a journey of 11 days, and its average breadth about nine days' journey. On the east it is bounded by *Ladákh*, which is a journey of 11 days from the capital; and on the west, by *Gilget*, a journey of nine days. *Yárqand* bounds it on the north at a distance of 12 days' journey, and *Kashmír*, on the south, a journey of nine days*.

Climate.—The valleys which intersect the country are warm, but free from the excessive heats of summer; and though cold in many places, partake of a more uniform and temperate climate, than might be inferred from their extreme elevation. During the winter months, the snow lies in the city about three spans in depth. It snows, but never rains. The atmosphere throughout the year is stated to be remarkably dry and clear. On the summits of the neighbouring mountains, the snow is perpetual.

Vegetable and mineral productions.—Its vegetable productions are nearly the same, but not so exuberant as those of *Kashmír*. There are a few trees, such as the plane, poplar, and willow, which grow to a considerable size. It produces every kind of fruit peculiar to a cold climate, such as plumbs, cherries, apricots, currants, walnuts, &c. An oil is extracted from the kernel of the apricot, which is universally used by the people for culinary and other purposes. The country abounds with rhubarb and asafœtida. Among the mineral productions may be named gold, sulphur, arsenic, and *Sohun Makhí*, which are found in the *Shakar* district. In *Revend* also, there are mines of gold, arsenic, crystal, and *Sohan Makhí*; and in the district of *Baraldoh*, there is a sulphur mine, the effluvia of which is so strong as to be suffocating to those who approach it. A stone called *Múrdár Sangh*, said to possess an antipoisonous quality, is found in some places. Forwards, the western extremity of *Shakar*, on the bank of a stream which comes from the *Nagar* territory, there is a hot spring; by bathing a few days in the water of which, persons who are subject to rheumatic affections or cutaneous disorders are sure of being cured, particularly those who are infected with disorders of the latter kind. On the top of the hill, which is situated near this spring, stands a *Chillá* or cell, where the superstitious Muhammedans are in the habit of worshipping the diety in abstraction for 40 days, during which they take no other food than a few grains of barley and the smallest possible quantity of water, consistent with the support of life†. The shrine was built by Sháh Nasir Amam Syed Khusro. To the north of *Hazúrá*, in the

* A day's journey averages about 15 miles.

† A form of penitence common in other Muhammedan countries.

district of *Duvan*, there is another hot spring, the water of which is so warm that if a drop of it fall on any tender part of the body, it will produce a blister. It rises to a height of $2\frac{1}{2}$ feet.

Mountains.—The territory of *Iskárdoh* lies in the midst of a region of mountains, exceeding in grandeur any in the known world; but depending for a description of the country on the oral evidence of a native, whose limited range of observation renders it difficult for him to convey his knowledge in a manner easily intelligible to an European inquirer; it would be vain to attempt a particular account of the mountainous features of the country*; much of the information that is now given must partake of the vagueness of the source from which it is derived. Where there is nothing, however, but a complete blank in the latest maps regarding a country which is likely to be interesting to the antiquarian, it seems better to throw even these faint rays of light on its history and geography, than to withhold them altogether, because they may not happen to possess the best claims to accuracy.

Rivers.—There are two great rivers, besides several small streams and innumerable springs; one of the rivers has its source in the direction of *Chílú*, and another comes from *Ladákh*. They unite near the fort of *Karkes*, and then taking their course by *Iskárdoh*, where the united stream, which forms a large river, is called *Gæmsú*. On its passage towards the plains, the same river is known by the name of *Atak*, or Indus. When the river rises, it overflows its banks, and spreads below the city to a breadth of 300 paces. Its ordinary width is about 100 paces. There are two boats in use here on the river, the first that are to be seen on the Indus in its course through *Tibet*. The other river rises near *Shakar*, and after being joined by the *Saghar* stream, falls into the Indus below the fort of *Iskárdoh*. The people from *Chílú* and *Iskárdoh* travel in the winter season by the river Indus on ice, and drag their baggage over the frozen surface by ropes.

Roads.—A high road leads from *Iskárdoh* to *Yárqand*, merchants travel by it in qafilás, but travellers and servants of the Government who go on business, proceed singly, or not, as may suit their convenience. It is crossed by a very lofty range of mountains, which is only passable with safety at a particular season of the year. There is a considerable road also by *Gilget* to *Kunduz*, *Balkh*, and *Bokhára*. The Usbeks came to *Gilget* with horses, which they exchange for

* From the magnitude and variety of streams which flow west and east of the Belat Ták, and Musták ranges, it is probable that the mass of mountains which spring from their basis reach their greatest height in the vicinity of *Sirakot*, which is on the north-west frontier of *Iskárdoh*.

gold. Other roads go to *Ladákh*, *Kashmír*, and the territory of the Yusafzaís. Between *Iskárdoh* and *Kashmír* there is an extensive *Dasht*, or wilderness, called *Beyarsa*, but by the Kashmírians, it is named *Deosu*; towards the southern end of which is a small lake, where travellers alight. The plain is covered with a coarse kind of grass and bushes. There is not a tree to be seen on it. It abounds with bears, and *tabarghan*, an animal which resembles and equals a monkey in size and appearance. A traveller from *Iskárdoh* to *Kashmír* enters the valley of *Kashmír* by the *Khoyameh* pass, which is subject to the authority of the Government of *Kashmír*. DILÁWAR KHÁN, the late proprietor of *Khoyameh*, is at present in confinement with the Governor of *Kashmír*, and SURAJ BHAN, one of the Pandits of *Kashmír*, has been placed in charge of the district*. The road to *Ladákh*, passed by *Chílá*, opposite to *Jhoriet*, which lies on the frontier of the *Chílá* district, is the *Teára* province, which forms the western frontier of *Ladákh*. From *Teára* to *Ladákh* is three days' journey eastward. There is a station for levying transit duties on the *Teára* frontier, the collections of which are remitted to the Ladákh treasury. From *Teára*, the pass of *Rahara Kharam* is three marches distant, beyond which extend the dominions of the Emperor of China. A regular communication is maintained on the Chinese frontier from one station to another by Chapars or *Suwárs*, instead of foot runners, who convey intelligence with great rapidity.

Divisions of territory.—Including the district of *Iskárdoh* itself, there are altogether nine divisions of territory actually subject to AHMAD SHÁH, the ruler of that country. Their extent is determined by the limits of the valleys in which they are situated. First, the district of *Baraldoh*, which is held by SULIMAN KHÁN, the nephew of the ruler. From *Baraldoh* to the city of *Yárqand* is a journey of eight days. Second, the district of *Parkotah*, in charge of GHOLAM SHÁH, his brother. It stands in an open valley, from which issues a road to *Kashmír*, practicable for horses. Third, the district of *Taltí*, which belongs to AHMAD KHÁN, his cousin. Fourth, the district of *Kartákhshá*, assigned to ALI SHER KHÁN, his nephew. There is a considerable stream between the district of *Kartákhshá* and the fort of *Soet*, situated in *Porakh*, a territory subject to *Ladákh*, and west of *Kartákhshá*; and east of *Soet*, situated also in the

* There are twelves passes leading into the valley of Kashmír. Each of them is held by a Malik, or chief, who is responsible for their safety. The Maliks derive the offices from the Moghals, who granted to them the territory in the immediate vicinity of the passes for their own support, and the pay of the guards necessary to their defence.

Porakh territory, there is another stream of nearly the same size. From the limits of *Kartákhshá* to *Ladákh*, a light *kasid* can travel in seven days; but a traveller with baggage requires ten days to make the journey. Fifth, the district of *Karkes*, which is held by YAQUB KHA'N, one of the AHMAD SHA'H'S relations. *Karkes* is bounded on three sides by the *Iskárdoh* district, and on the fourth, or eastern side, by *Chílú*, which was originally included within the government of *Iskárdoh*; but about three years ago, the chief of it, named MEHDI KHÁN, revolted and setting the authority of the ruler of *Iskárdoh* at defiance, has entered into an alliance with the "Gelpo" or ruler of *Ladákh*. As the Governor of *Chílú* is married to a niece of AHMAD SHÁH, the ruler of *Iskárdoh* is restrained by considerations of delicacy from attacking and reducing him to obedience. The district of *Chílú* lies five days' journey distant to the east of *Iskárdoh*: and from *Chílú*, the *Ladákh* frontier is only one day's journey. Sixth, the district of *Nagar* is situated in the hills, about seven days' journey to the north-west of *Iskárdoh*, and constitutes the Jagír of FIROZ SHÁH, a dependent of AHMAD SHÁH. From the town of *Nagar* to *Sirakol* is eight days' journey, and from *Sirakol* to *Yárqand* is the same distance. Seventh, the district of *Randoh*, the Jagír of ALI KHÁN, the nephew of AHMAD SHÁH, which is reported to be much less elevated than other parts of the country, and the climate and productions to partake of the difference in elevation. It is famous for grapes, and also produces rice, figs, and pomegranates, which are not found in other parts of the country. Formerly, it was subject to the authority of AHMAD SHÁH'S ancestors; but it was wrested from them during a period of anarchy by the chief of *Gilget*, in whose possession it now remains. Beyond the fort of *Randoh* a journey of five days' is the territory of *Gilget*, in the possession of SULIMAN SHÁH. Eighth, the district of *Hazúra* is the *Jagír* of the son of the ruler of *Iskárdoh*, and is bounded by *Kashmír* on the south.

City of Iskárdoh.—The city of *Iskárdoh* appears to be situated in a valley of some extent. It is built on an isolated hill, bounded on two sides by the river Indus. From the south, the ascent by the road is about two and a half kos. On the summit of the hill is the fort supposed to have been erected by ALEXANDER the GREAT. It is now merely used as a citadel or station for a guard of soldiers. The residence of the ruler, together with some habitations belonging to his relations and dependents, is situated on a projection of the hill about half way from the top. At its base runs the river, and on the other side of the river, about a kos and a half distant, lies another isolated hill, which is called *Barkh Kharah*; beyond which, in the same direction,

to *Baraldoh*, three days' journey from the capital, the country in general is of a level description. To the south of the city there is a plain about seven or eight kos in extent, which is covered with cultivation and gardens. The other two sides of the hill of *Iskárdoh* are chiefly occupied by the population of the city, and the aspect of the country for a day's journey in those directions also is open and well cultivated.

Fortified places.—There are several fortified places within the limits of the *Iskárdoh* territory; some are situated on the frontiers, and others in the interior parts. Every fort has a separate jurisdiction. The fort of *Iskárdoh* has already been described. It is called by the natives *That Iskárdoh* and *Kharpúcheh*, which means the chief fort. At a distance of half a day's journey to the south of *Iskárdoh* lies the fort of *Shakar*. *Shakar* is the chief town of any note in the province next to *Iskárdoh*. It is situated in a narrow and well-cultivated valley, about 13 miles long. The hill itself is about 500 paces high. There are several hills in its vicinity but none of the same height. The fort is supplied with water from the foot of the hill. There is a stream running through the valley of *Shakar*, from the bed of which the people collect gold, the quality of which is stated to be superior to that which is found in any other part of the country. At the eastern end of this valley is a hot spring, where the Gelpo has formed a residence, to which he occasionally resorts. *Kartakhshá* is also a fort of some note. It is situated on the Indus, in the vicinity of some high hills. The country about it is said to be rugged and difficult, and the fort itself to be a place of some strength and importance, from its situation on the *Ladákh* frontier.

Population, character, and habits of the people.—No correct estimate can be formed of the population of the country. It is said to amount to three lakhs of families, which in all probability greatly exceeds the actual number. The people are divided into several different tribes, but they are generally known by the name of Baldi. Among them there is a tribe called Kerah, the members of which are enjoined by their religious laws to follow four ordinances, viz. first, to destroy their female infants; second, not to tell falsehoods; third, not to desert their party in the day of battle; fourth, not to slander any one. The natives are described to be of a phlegmatic disposition, like other Tibetan tribes*. They are a stout, well-made race of people, with ruddy complexions and good features; but have

* Asiatic physiologists maintain the opinion, that the temperament of man is affected by the nature of the animal or vegetable production on which he feeds; and the phlegmatic character of the inhabitants of little Tibet is accordingly ascribed to barley, millet, and fruits, being their chief articles of food.

little hair on their body, and scarcely any beard. It is said, they are deficient in enterprise, and of a treacherous and designing disposition. Barley, wheat, and flesh are the chief articles of food; rice is not generally used. All those who can afford it are in the habit of drinking tea at their breakfast, and in the course of the day, it is usual with them, as with their neighbours of *Ladákh*, to greet their visitors with a cup of tea. The use of this luxury is becoming more general than it was, though it bears a high price. There is little variation in the dress of the people from their neighbours of *Ladákh*. The wealthy classes generally wear *qábas*, (a kind of coat, with skirted margin all round,) and caps, &c.; while the dress of the peasantry consists of *jamahs*, (another kind of coat, formerly much used in India.) It resembles the vest worn by the Indian dancing girls, and is made of *pattú*, which is manufactured both of a coarse and fine quality, from goat's wool. They wear caps of the same stuff*. Cotton is not produced here. It is imported from *Yárqand* to *Kashmír*, but very few people shew a desire to wear cotton clothes. Their houses are mostly made of layers of stones and wood, with flat roofs, and are two or three stories high, with far projecting roofs, somewhat similar to those on the southern face of the Himálaya range.

Religion, language, and means of exchange.—The common religion of the people is Muhammedan, of the Shia sect, and the followers of the IMÁM JÁFAR; but towards *Gilget*, there is a race of people which does not seem to possess any well-defined religious system: some of them are idolators, and worship trees; while others, like the Hindús, do not eat the flesh of kine, and yet profess to be Muhammedans. Tibetan is the common language of the country, but the people have no books in it. They are beyond the influence of the Lámas, and receive their education, which is exclusively confined to the chiefs and priesthood, in Persian. They have no system of coinage in the shape of rupees, pice, or kouris. The only means of exchange known among them is in small pieces of unwrought gold, which is found in the country both in mines and in the beds of rivers.

Government, military establishment, and revenue.—The government of *Iskárdoh* is absolute, but the ruler AHMAD SHÁH, who claims his descent from JOSEPH the prophet of the Israelites, is mild and benevolent; his title is *Ergh mayúm*, signifying the Lord of the mountains; but among his people he is called "Gelpo," or king, and his tributaries and petty chiefs, Ju. He usually resides in the fort of Iskárdoh. It

* It is not customary to milk the goat in this country, which is supposed to add to the softness of the wool.

is asserted, that the dynasty of the present ruler has been in uninterrupted possession of the country for the last 14 generations. He does not owe allegiance to any foreign state, being subject to none in tribute or service; but the Sikhs have attempted to extend their conquests beyond *Kashmír* in that direction, which has tended to excite his alarm and jealousy. There is no standing army; the troops of AHMAD SHÁH consist of his vassals. They are landed proprietors, who receive no regular pay, but are exempted from taxation in requital of military service. Whenever an exigency occurs to render the collection of a force necessary, the ruler calls out the peasantry of the country, and forms them into a sort of militia. He provides them with arms and ammunition, so long as they may be kept embodied; and when the occasion for their services is over, they are disarmed and dismissed. The revenue of the state is collected in kind in the following form:—one kharwár of wheat, one of barley, and one of mustard or millet are levied from each landholder. Some of the zemindars pay their rents in one kharwár of ghí each, instead of the other three articles. A kharwár is about 40 seers in weight.

Extension of Sikh conquests in the direction of Iskárdoh.—Lying between *Kashmír* and *Iskárdoh*, there is a small territory called Kathaí. About seven years ago, KIRPÁ RÁM, the Governor of *Kashmír*, sent a force of 500 men to erect a fort there. The *Muzaffarábád* chief, of whom it was subject, opposed the design; but KIRPÁ RÁM persisting in his object, an action ensued, in which the Sikhs were defeated, 200 of them were killed and wounded, and the rest taken prisoners, who were converted to Muhammedanism. After the action, the chief of *Muzaffarábád* advanced to *Bará mulá*, and reduced the Sikhs to take refuge in the fort at that place; but he was soon obliged to retire. The Sikhs being reinforced, renewed the attack, and ultimately established their authority in Kathaí.

Connexion with the Chinese frontier.—The northern limits of Iskárdoh are connected with the Chinese frontier. There are known to be three great tribes among the people of *China:* one of them is called Manchu, from which the royal family is descended; another *Kara Khatai*, (implying black-colored,) which inhabits the eastern part of the *Chinese* empire; the third, *Tingani:* these are Muhammedans, and occupy the country on its western frontier.

State of the north-western provinces of China, with an account of the origin and progress of the insurrection which broke out in 1827, *to subvert the Chinese authority in that quarter.*—*Kashghar, Yárqand, Khotan, Axu, Ilah,* and the country of the *Sarah Nashin*, generally called

Kalmaks, as well as five or six other extensive tracts of territory formerly belonged to the *Turkmáns.* A long time ago the Emperor of China invaded these places with a large army, and seized them from the *Khojan,* who was then in possession of the government, and exercised both a temporal and spiritual authority over his people. In the course of the war, many of the Turkmán chiefs, as well as the Khojan himself, fell into the hands of the Chinese, and were put to death; while the rest of the royal family, among which was the eldest son of the Khojan, who took the title of his father, sought an asylum with the ruler of *Indajan,* where they remained waiting a favorable opportunity to recover their country. The Emperor of *China* offered 700 *Zambus,* (silver ingots, weighing about 150 Rs. each,) to the *Indajan* chief, if he would prevent the escape of the Khojans. About three years ago, when the Khojan was still at *Indajan,* the Chinese force stationed on the frontier was withdrawn towards the *Kara Khatai* country. When the Khojan heard of the departure of these troops, the ruler of *Indajan* let him loose, and the Khojan collecting a party to Kirkpiz, whence he sent a man to *Kashghar,* to ascertain the disposition of the people, they replied that the Chinese force had gone to *Kara Khatai,* and he had only to come and possess himself of the whole country. According to their invitation, the *Khojan* marched towards *Kashghar,* where, no sooner had the Khojan made his appearance, than the people declared in his favor, and rose against the Chinese, about 8000 of whom were sacrificed to their fury. The Aubu or Chinese governor of the province destroyed himself by gun-powder. As soon as the news of the occupation of *Kashghar* by the Khojan reached the ear of the governor of Yárqand, he announced the event to the Emperor, by means of lighted balloons, which were set off and repeated at every stage, until the information reached its destination. The Emperor returned a reply in the same way. This mode of conveying intelligence was never adopted by the Chinese authorities. The Khojan succeeded in recovering *Yárqand* and *Khotan,* and every one who was suspected of being in the interest of the Chinese was immediately killed; but the Khojan met with some resistance in his attempt to occupy *Axu, Ilah,* and the *Kalmak* territory, in consequence of the presence in them of the Chinese garrisons, and their vicinity to each other. Reinforcements were sent also from China to *Kashghar,* and after the lapse of a year, the Chinese succeeded in dispossessing the Khojan of his acquisitions; and making a prisoner of him, they confined him in a cage, and led him captive to the Emperor. His fate is not exactly known; some say that he who has been carried into captivity

is not the Khojan; that the Khojan himself effected his escape to *Indajan*, and is now alive.

The tribes of Kashghar, Yárqand, and Khotan, and the part they took in the insurrection.—The population of *Kashghar*, *Yárqand*, and *Khotan* consists of two tribes; the one is called Aghtaghlaq, and the other, Karataghlaq. When the Chinese troops arrived for the recovery of *Yárqand*, the Aghtaghlaqs were all on the side of the Khojan, in revenge of their adherence to whom the Chinese authorities slew all their males, gave their females and children to their own countrymen, and sent them into distant parts of *China*. Of the *Karataghlag*, such as favored the Khojan, were killed, and the rest set at liberty.

Commercial operations of the Russians on the Ilah frontier.—About a year and half ago, a report was received of the Russians having taken *Kapchaq*, and arrived at *Ilah*, which is a great entrepôt of commerce. Between Ilah and the Russian frontier post is an extensive lake, on the border of which the Russians are stated to have established a fort, and to have built a town in its vicinity. Not wishing to be involved in hostilities with the Russians, the Chinese are said to have paid them a large sum of money to purchase peace. The chief of *Ladákh* has informed the Emperor of China, that the English are constructing a road to *Kaughri*, which is situated near *Ispitti*. On the receipt of which intelligence, the Emperor sent a Zandu, or personal inquiry, to Arzeng, to watch the state of affairs in that quarter; and ordered at the same time, his garrison of *Rodokh*, which is 12 stages from *Ladákh*, to be reinforced by a large force.

Opinion of the people of Iskárdoh of the power and authority of the Emperor of China.—It is said, that the Emperor of China has 3000 Zandu in his service, and that whenever any affair of importance occurs, one of them is dispatched to settle it. They enjoy great confidence, and supersede the authority of the Aubus or governors, where they may happen to be sent. If at any time he should suspect or be dissatisfied with the conduct of the Aubus, he deputes a Zandu to look after him; they are his most confidential agents, and possess high influence in the state. Wherever a Zandu is, his acts are supreme, and no one can dare dispute his authority.

Articles imported from Russia.—Twisted gun barrels; Bulghar hides; cast-iron vessels; horses.

Imports from Yárqand and Kashghar.—Colored cotton piece goods; scarfs; salt; China silk pieces; tea; and *China crockery-ware.*

Exports.—Unwrought gold; *zard alu* (apricots), and other dried fruits; rhubarb; asafœtida.

II.—*Journal of a Tour through Georgia, Persia, and Mesopotamia. By Captain* R. MIGNAN, *Bombay European Regt. F. L. S. and M. R. A. S.*

[Continued from page 590, vol. III.]

After arranging our baggage, and paying the boatmen a tomaun, which is equivalent to 12*s.* 4*d.*, we directed our course due south, and soon arrived at the gates of Meandáb or Meandow. On entering the town, we passed through filthy lanes, bordered by mud walls; scrambled over ruined huts, and descended deep pits, that furnished materials for new ones; till at length we gained a lofty dilapidated wall, enclosing the principal dwellings, and entering the gateway, passed through a miserable bazar. We looked in vain for streets, much less decent buildings, (a few ants' nests presented themselves,) until we were conducted to the houses of some wealthy merchants—these were most carefully concealed from view by high mud walls of the most wretched appearance, and encircling them were the huts of the poor artisans and cultivators. Although night was fast approaching, no lights were seen in any quarter, except the bazars, which were in fact, the only thoroughfares that deserved the name of streets.

We took possession of a large house, the property of one JÁFAR KU'LI KHÁN. Its rooms were capacious, its walls white-washed, and what is very uncommon in Persia, its height was nearly one hundred feet. This edifice was fast crumbling to decay, and upon its summit great numbers of storks had built their circular nests of reed. The natives of the place called them "*Háji Lag-lag,*" the former title, from their making a yearly pilgrimage to the level countries during the winter season, (*yea, the stork in the heaven knoweth her appointed time; Jeremiah,* viii. 7,) and the latter, from the loud clattering sound made by its long bills. Although these birds are considered unclean, (*these are they which ye shall have in abomination among the fowls, the stork and heron after her kind; Leviticus,* xi. 13, 19;) yet, they are marked by qualities of an amiable nature, and so attached to house-tops, they appear under no fear of being dislodged. Indeed the natives entertain an idea that they bring a blessing to the dwelling on which they build, and in Egypt, they are held as objects of veneration. BRUCE in his travels, remarks that it was a great breach of order to kill any of these birds in Cairo, and ALI BEY mentions an extraordinary establishment at Zez for the treatment of lunatics: "it is very strange that great part of the funds has been bequeathed by the wills of various charitable testators, for the express

purpose of nursing sick cranes and storks; and burying them when dead."—(See Travels of ALI BEY.)

Meandáb is on the frontiers of one of the most remarkable regions in the world—Kúrdistán, the Switzerland of the East—an immense succession of hill, valley, dells of exhaustless fertility, and mountains towering to the height of Mont Blanc. The top of the great range of Zagros rises upwards of 12,000 feet above the level of the ocean! The oppression and cruelties it has endured; the vengeance it has inflicted upon its Turkish and Persian neighbours; and, above all, its acquisition of independence: these circumstances together invest this country with a peculiar interest. The geographical division of Kúrdistán is nearly as follows:

Kúrdistán proper, comprising the country lying between the degrees of northern latitude 35 and 38, and longitude 43 and 46, ..	Inhabitants,	250,000
Ardelan, ...	Do.	150,000
Adiabene, ...	Do.	100,000
Total, ...		500,000

Of this population, at least four-fifths are Kúrds; the rest are Christians and Jews. The mountainous regions have at no period been under the Turks or Persians. The horse and the sword had made them masters of the plain; they became feudal possessors of the territory under the tenure of service to the SHÁH, and held the remaining Kúrds as cultivators of the soil. But thousands removed to the security of the mountains, and as the Turkish or Persian chain became heavier, they flung it off, and joined their free countrymen. The vacancy produced by this flight has never been filled up, though large emigrations have entered the country; and in whatever quarter they settled, they have been hardy, active and intrepid.

Turkish oppression, on the one hand, and Persian, on the other, has been so directly the source of the chief defects in the Kúrdish character, that in proportion as that fatal influence is weakened, so rises the national character. Its nature is so elastic, that it springs up, even in every momentary removal of the pressure; but its true displays are to be found where the tyrant dares not come. The greatest contrast to the inhabitants of the plains is to be found in those mountainous retreats where there are no foreign inhabitants. Here the Kúrds are hardy and heroic, passionately fond of their homes and country, and subsisting on little. The picture has its dark side. They are inconstant, envious, and treacherous. But it must be remembered, that these defects would be the natural qualities of any people leading such uncertain and distracted lives. In his most

inaccessible hold, pent up amid wild tracts of country, shut out from general communication, liable to frequent and sudden inroads of a merciless enemy, and from his cradle to his grave, either the spoil or the antagonist of the oppressor. Poverty, suspicion, loneliness—a life of hazard—flight or attack—what original constitution of virtue could have attained its true stature? There is no national character that would not have darkened under this perpetual rudeness of fortune. It is really astonishing that the Kúrd retains any qualities entitling him to rank among men.

For several centuries Kúrdistán has been a continued scene of war, turbulence and robbery. Some of its eastern districts have remained in the power of ABBÁS MIRZÁ, whose force has never been able to reduce to subjection the various chieftains in the north and south, who claimed a predatory independence. The form of the country, indeed, is sufficiently favorable to such pretensions; being intersected by mountainous tracts, over which it is extremely difficult to conduct an army. The Eliáts, or wandering tribes, roam over its extensive plains, and the Persians, from Azerbiján, have long carried their ravages not only over the frontier, but into the heart of the country, over its ranges of hills, and to the gates of its towns. The desolation and want of security can hardly be conceived, when occasioned by these ravages. In some tracts, the whole open country has been swept, the inhabitants having been put to death, or carried away as slaves. The consequence is, that numerous small towns, particularly near the frontiers, have been abandoned, as well as all cultivation. The peasant goes out to his labour with his matchlock slung over his shoulder. All intercourse between villages is carried on with the greatest timidity, and at intervals, when a sufficient number of men can be collected to form a káfilah, and to resist the bands of robbers, even these are frequently attacked, and the merchants and travellers composing them not only plundered, but detained in captivity, or murdered. This state of things has given rise to extensive dealings in slaves.

The tribes which range the deserts differ in their habits, according to the circumstances in which they are placed. In some parts they are pastoral, hospitable, and kind to strangers; in others, they are reserved, and shun all intercourse; in others again, predatory, cruel, and ferocious. Those of the latter description are to be found near Lake Van, and in Armenia, towards Erzeroum*. We find them to the north, on the

* As a proof of this, I may mention the recent murder of M. SCHULTZ, a distinguished antiquarian and indefatigable traveller. This melancholy event

borders of Georgia, plundering villages, committing outrages, attacking towns, and carrying off Georgian and Circassian girls. On the south, they dispose of their captives, to the traders who supply Bagdad and other Turkish cities; and on the east and west, are found the wild mountaineers, who are not naturally cruel, but obliged in self-defence to assume a fierce character. This effect can only be ascribed to the distracted state of Kúrdistán, and its inability to afford security to the people.

April 5th.—My muleteers were slow and reluctant to load the mules this morning, having heard during the night that the Kúrds of these parts were a most desperate set, caring for neither God nor devil; that they never took off their boots from one year's end to another, much less prostrated themselves in prayer; that in fact, we should starve by entering the country, as it would be impossible to hold any communications with them. With little difficulty I convinced them in some degree that these opinions were erroneous, and we quitted Meandáb, directing our course south-east, over a plain surrounded by argillaceous mountains. We then struck into a deep valley, profusely covered with coarse weeds and herbage, and through which flowed a stream formed by the melting snow. When we got half way up this valley, we saw several Kúrdish encampments on our right. They appeared very meanly built, chiefly of mud: they were low, having only one small door to admit light and air, and were roofed with a thatch of reed. There were others formed of two stone walls, with a covering of goats' hair cloth. Although our people were dying with thirst, they would not stop from the fear of being plundered; I, however, rode up to one of these encampments, and was served with *lubbon*, which is a very refreshing beverage. After this, I rejoined the baggage, and we continued to pursue a southerly course, and passed a large body of Kúrds, whose extraordinary dress and appearance, so different from that of the Persians whom we had been accustomed to see, gave a novelty to the scene that was extremely interesting. Their arms, their habits, the furniture of their horses, resembled those of the Turks; but they possessed

took place near the village of Bash-Kullah. Sir JOHN KINNEIR immediately sent a confidential person to the spot to collect, if possible, the traveller's papers and effects, and to take steps for the punishment of the murderers. The loss of this intelligent traveller is one of the greatest which oriental literature has ever sustained; it is to be hoped, that the larger portion of his manuscript collections had been received in France, and that those which were in his possession at the time of his death may yet be recovered: so that the fruit of his extensive travels and laborious researches may not be lost to the world.

a wild ferociousness of air, which is highly characteristic of their wandering life. This interesting group would have been a fine study of costume for HAYTER's accurate pencil. Two of this party joined us, and in a mixed dialect of Persian and Arabic, asked me if I was not going to Sulimániah; for, said they, "we are anxious to visit that city, to pay our respects to SU'LIMAN PASHA, and if possible, to obtain his head for a *foot-ball*." Not liking the appearance of these cavaliers, I was determined to try at an escape by a *ruse de guerre*; so exclaimed, with a feigned astonishment, "Sulimániah! then, I have been misdirected, I am bound for Hamadán, and find I am wandering from my way!" This had a proper effect; for they faced about, and joined their companions. We rode for nine farsangs through a country remarkably well cultivated. The valley we had entered presented an inclined surface to the west, from ten to fifteen miles broad, including the skirts of the hills on either side, little interrupted with irregularities, and all capable of the richest culture, though a great portion lay waste; but the villages were so thinly scattered over it, that it was surprising to see the extent cultivated. The whole soil of the valley was of a fine light-coloured clayey loam; its surface being slightly diversified by hillocks, chiefly artificial, the sites of old villages. A stream of no great natural size, but at this time swelled by the dissolving snows, glided through it, and the hills undulated and retreated into small plains, which were luxuriantly cultivated. I was told that these glens produced wonderful crops, with the aid of a little artificial irrigation. The main valley appeared less productive, but sufficiently so to prove the existence of great fertility of soil, and human industry. Few parts of Persia could equal it. As the inhabitants of the villages are both shepherds and cultivators, they were at this time ploughing the land. During summer they descend to reap the harvest, and leave their wives and children in care of their meadows, and the flocks that graze upon them.

Continuing our route, we passed through an irregular and winding ascent, which brought us to the village of Bogám, situated on the bank of a small rill, which ran into the river Jakuntú. Nothing could exceed the appearance of poverty which prevailed throughout the place, or the want of comfort and security. This is doubtless to prevent the excitement of any cupidity; for even this appearance of squalid misery does not protect the inhabitants from oppression; nor in this neighbourhood are they ever free from the incursions of the Persians. It was only the other day, that JÁFAR KU'LI KHÁN, the governor of Marangha, was ordered by Prince ABBÁS MIRZA to

render this part of Kúrdistan a desert, and to destroy by fire and the sword all the hamlets and their inmates that might cross his track. The Prince's order ran thus: "hang the men upon the trees, and tear them asunder; rip up the women, and tread over them." Upon his approach, the inhabitants flew to the adjacent mountain gorges, and over summits which, as the Persian poet observes, "were never trod by human foot, and scarcely ever by the wild birds of heaven." The order was obeyed in regard to this village, which is now little better than a heap of ashes. Two short years have only passed since I was here on my homeward route, and then Bogám was a flourishing little town.

Not being able to procure forage for our cattle, or even refreshment for ourselves, we departed hence before the dawn of day. Mírady, the object of our march, lay at a distance of thirty-five miles, and the road appeared unusually rugged. About noon we reached a lovely plain surrounded by mountains. Spring had already strewed the ground with her richest bloom; and the brightness of the sky, together with the picturesque appearance of the country, filled the mind with delightful ideas. A serpentine stream meandered through this delicious spot, and the most beautiful lawns diversified the scene. At length we came in sight of the village, and were soon received by its chief, who ordered his women to give us the best room in his cottage. They busied themselves with great humour in clearing away their domestic utensils, and lighted a bright fire for the evening. These women were fair and handsome; they had black eyes, and long dark hair; low in stature, with delicate features. The children of both sexes had fine ruddy complexions, though of course they soon contract a tawny hue. The women of this district appeared very industrious, and always were seen assisting in the toils of agriculture; and on no occasion did they conceal their faces, but went about entirely unveiled; though it was considered a mark of impoliteness to stare at them, nevertheless, they appeared highly gratified at exciting our attention, and we clearly perceived that vanity was the characteristic of the sex in this, as well as other, countries.

After being served with delicious cheese made from the milk of sheep, and some excellent flat cakes of bread, the chief of the village invited me to his home. On entering the house, I saw three or more men seated in a corner of one of the rooms, with some rude-looking instruments resting on their laps. One resembled our flageolet; another, the guitar; and a third, the kettle-drum. A signal being made, one of the men advanced, and seating himself in the

centre of the room, sung a wild air, which was neither pleasing nor melodious. After this, two boys got up and danced; placing themselves in a variety of extraordinary attitudes, which consisted principally of gesticulation. The old chief said, he considered dancing both mean and ignoble, as it was practised by none except such as make a trade of it for hire. But he must have spoken ironically; since the moment they were done, one of the boys presented me with a chibouque, and was very officious, which intimated, that a recompense was expected for the evening's amusement.

April 7th.—After taking a hasty meal, and smoking a chibouque with the chief of the village, we continued our way south-easterly, through a glen, where it was refreshing to observe the quantity of cultivation that appeared on every side. On entering a larger valley, a great extent of meadow land was observed, as well as several hamlets. Here also, for the first time, did we remark wood in any considerable quantity upon the hills on our right, which were a ramification of the great Zagros range. The trees were bare of leaves, which made it difficult to determine their species. We now entered a thick jungle, intermixed with rocks, and matted over by creepers. This spot I can never forget, for we were amid an endless variety of forest scenery. The masses of shade thrown down from the naked and fantastic crags that burst abruptly forth, the luxuriant fertility of the mountains, seen through the transparent clouds that floated along below their forest-crested summit, the awful stillness, and the immensity of individual objects, were pregnant with delight and amazement. I have often gazed amid these wilds, while beauty after beauty bore in upon my eye and mind, till I have turned away with a painful fulness at heart; and if my delight were more than was fit for the frame that felt it, I sometimes really thought there must have been some deleterious power in the air breathed in these scenes, until I remembered their palpable and irrefutable beauty. I looked upon the present prospect as if I knew I should never see it again. The snow-capped mountains were towering before us, the sea of forests spreading around; far below, a beautiful stream rippled in the sun, and sent up the music of its plash! The small Muhammedan sepulchre, overshadowed by the tamarisk, crested the banks on the opposite shore, whence streams spread through the bright green land they fertilized, to where a bulwark of hills rose to the clouds beyond the white summits of Mount Zagros.

To clear us from this wooded bower, we hired a shepherd, who appeared to have returned from the plain we had crossed in the morning. The man performed his task faithfully, being allowed no

temptation to do otherwise; and from his knowledge of the road, greatly shortened our distance. During the march, we frequently passed parties of ill-looking fellows, who were travelling to the town of Ouroomia, and whose inquiries about us, as they greeted our guide, excited something more than my curiosity. I therefore asked him, if those people would have lightened our cattle of their loads, had we been less prepared? "Of course," he replied, "and *we* of our village would do the same—we none of us scruple, when fair opportunities occur." This avowal, uttered with the greatest *sang froid*, evinced a resolute principle of rascality; but as we afforded no "fair opportunities," we got on famously together, till the necessity of our acquaintance ceased. We passed an extensive encampment of Eliáts under some overhanging rocks: their wild appearance, mingled with horses, asses, oxen, and sheep, were admirably characteristic of the place, as they met the eye, gathered together in groups around a fire, which emitted its thin spire of smoke. Had *we* known of their vicinity, we should certainly have endeavoured to pass by a circuitous path; and had *they* been apprised of us, our property would not perhaps have remained unmolested. They were very inquisitive, demanded whither we were travelling, talked both loud and long, and endeavoured to persuade us to remain for the night under the protection of their tents. The scenery around us became so singularly wild, that I regretted the approach of night. Our progress was often much impeded by the thickness of the wood; but on descending towards a small village, which appeared in a retired nook of the opposite hills, the cliffs grew more majestic, the precipices more lofty, and the forest more beautiful. On reaching the enclosure of the village, we were forced to remain a long time in waiting, before any shelter could be found for us; and after all, to take possession of a hut, hastily emptied for the occasion, full of dirt and vermin. Every thing was in confusion, and our foolish Muhammedan, instead of exerting himself, stood like a drunkard biting his whip, without ever offering the slightest assistance. Our evening meal was late and cold, and we retired to rest as little pleased with ourselves, as with our attendants. Next morning the inhabitants came in a body to assure us, that it would be impossible to cross the mountains without lightening the mules; and that even then, the passage would be extremely difficult. I thought this a mere pretext to obtain some money, so refused to employ them in any manner. However, they knew the state of the road better, and following the muleteers, soon convinced us that their services were indispensable. The morning was excessively cold, and as we approached the mountains we had

to ascend, the cattle wound through a sort of rut, or channel, worn in the solid rock, where the width barely allowed us to pass without touching its sides, so that we were frequently obliged to hold up both feet in a horizontal direction, level with the animal's back, to prevent their being bruised between its sides and the rock, which could not be avoided by any other mode. On reaching the base of the mountain, we found that it was extremely precipitous, and consequently were obliged to indent upon the villagers, who triumphantly came forward, and assisted in supporting our cattle. The ascent, which was circuitous and abrupt, occupied the space of four hours, and proved so distressing to the mules, that they were forced to be relieved of their loads. This appeared to assist them very immaterially, as huge masses of snow lay in ravines in every direction, and they sunk to the girths at each step, when, in endeavouring to rise, two of them rolled down the precipice with their loads, which consisted of dead bodies *en route* for Kerbala. On nearing the summit, the road was so terribly furrowed by the dissolving snows, that its ascent became nearly impracticable. The difficulty of this passage was heightened by the conduct of a body of Kúrds, who from the top had been watching our approach, and now commenced hurling large stones upon those bearing our baggage. My muleteer, who had been quaking for the safety of his mules, became much alarmed. "Stakhferallah!" he exclaimed, "there's enough of them, to be sure!" "Never fear, I replied; by the help of Allah, and the Prophet, we may check their fury." "Had we only a dozen brave Kazilbáshes, with their matchlocks and swords, you might then talk so; but now," said the old monkey-faced muleteer, "I fear I shall become a beggar; nevertheless, Allah-hu Akbar!" By this time our trunks had been thrown down in the snow, and the fray commenced with huge crooked sticks, sabres, and matchlocks, mounted with prongs, resembling a hay-maker's pitch-fork. The enemy soon lost the support of four of their party, who were conveyed away wounded, and the majority of the rest in all probability would have willingly given up a contest in which so little was to be gained. But there were among them some of a determined spirit, who urged on the rest to revenge their wounded companions, and exerted themselves successfully to inspire them with confidence. My pistols being loaded, I went amongst them, and threatened to shoot the leader, when they cried out with surprise, "They have guns." This appeared to cool their rage and determination, and on their retreating to the edge of the mountain, we succeeded on rolling them over its side, while the snow shelved down upon their heads, and nearly buried

them. The Memándár, who had hitherto remained an inactive spectator of the scene, approached me, bowing respectfully, and said, "Bárik-allah! Mash-allah! may your shadow never be less; may your servant find grace in your eyes!" but instead of noticing his nauseous expressions, I ordered him to return to his country, as his services were dispensed with. The success of this *debut* gave animation to the old muleteer and his assistants, who exclaimed, "Pundh-be Khodah," and recited a passage from the Qorán, in which the words "La Allah il Allah, Muhammed Rasúl il Allah," were very frequently repeated.

After a most laborious descent from the mountain, we traversed its base in a southerly direction, passing on our way a ruined caravansary, from whence the Kúrds had issued; thereby converting into a place of molestation to the traveller, what had been erected for his accommodation. This mountain terminated in a sharp point; after rounding which, we entered upon well cultivated land, extending to the village of Bannah. Two miles to the northward of this place, we crossed a considerable stream of water, and near its bank several extensive burying places were situated. These places of sepulture were at a considerable distance from any town, and the graves were all distinct and separate, each having a rough block of stone placed upright, both at the head and feet; while the intermediate space, instead of having a slab placed horizontally, was either planted with flowers or covered with broken pieces of tile. Some few graves had circular rooms, with cupolas built over them, which being kept white-washed and ornamented, exhibited an excellent comment on the expression of our Saviour, when he compares hypocrites to "white washed sepulchres, which appear outwardly beautiful, but within are full of dead men's bones and all uncleanness." The funerals of the Kúrds have a reference to those of the Hebrews. How earnestly does the patriarch Jacob enjoin his sons to bury him in Canaan, in the family sepulchre; and Joseph, in like manner, exacts an oath from his people, to carry his bones with them when they leave Egypt. If a Kúrd dies at a distance from his native village, the inhabitants are bound to remove the corpse, and inter it with decency. I have often met a party escorting one who was never more to smile or weep in this mortal world, and on conversing with them, they dwelt upon the disgrace and ill-luck which would be attached to him who neglected to bury a body in its "proper place of rest." We observed graves decorated with garlands as among the Welsh, which are removed at the end of the mourning. We reached Bannah at night-fall, nearly exhausted by fatigue and hunger, and assembled round a

blazing fire in the Sheikh's house, where some excellent coffee was ready to be offered. I have often wondered how these people could have lived before the discovery of this beverage, the champaigne of the East. In the most desolate Khan it is handed round, and if you refuse to carry it to your lips, you are considered to be displeased with your accommodation, or at the behaviour of your attendants.

In the room next to the one we occupied, three Turks were reposing. In the course of the evening they requested I would share a pipe with them. After smoking together for some time, one of them said, "We have just arrived from Bagdad, and are travelling *Chupper* (post) to Tabriz. Where are you going? Have you got any money? Are you a Russian spy? Perhaps you wish to enter DAOUD PASHA's service. He has already a Feringhí (alluding to Mr. LITTLEJOHN, formerly Adjutant of H. M.'s 2nd or Queen's Royal Regiment,) instructing the half-starved Fellahs how to put themselves into a number of odd positions." One of his companions interrupted him, saying, "He is not a *Feringhí*, but one of the *Ingrése* from Hind, and a sharp fellow too; though I don't like to see these changes, or we may all be turned into the great desert." I asked what had occurred at Bagdad? The Turk raised his head, and without ceasing to attend to a large coffee-pot which was on the fire, began, "By my soul, DAOUD PASHA, our master, will soon have no more Tchocodars; he prefers the Giaours to us already! What shall we do if the Pashas and Aghas are able to eat us as they like? We must all fly to these mountains, and become Kúrds! Our Fellahs are all discontented, the taxes of the unbelievers have been increased, and perhaps even Mussalmans will have to pay them. Those Muscovite dogs have revolted against the Sultán, because he would not make their Sheikh a Sultán also. Even the Ingrese will soon compel the true-believers to chastise them, as I have heard say they now refuse to pay tribute, and even MAHMOUD himself is more like them than a true believer. He likes their ways better than his own. God is great; he knows if these changes are for the better: and as to that son of a dog MUHAMMED ALI PASHA, who has done it all, may Allah grant that his eyes may burst." "Inshallah, Inshallah," shouted his companions, who considered their friend's speech a very eloquent one.

On our quitting Bannah, the temperature became more moderate, the country was hill and dale, and the whole one continued coat of verdure. From hence the sloping sides of the mountains were covered with oak trees, and to us, who had been accustomed to the arid hills and mountains of Persia, it was a luxurious prospect. The road afterwards wound through wild and rocky defiles in the moun-

tains, and by the side of a rapid torrent. We followed its rills, which were beautifully fringed with willows, presenting to the eye a pretty appearance. It is this plentiful supply of water which renders these tracts so fertile; while in Persia, this inestimable blessing is the most scanty of nature's bounties. The plains and hills are also equally destitute of wood—a few trees only being planted in the environs of cities, chiefly, if not entirely, for the purposes of building. So great and manifest are the natural advantages of Kúrdistán, that the verdict of all travellers is unanimous in commending the fertility of her soil. But since the beginning of that time from which we have any authentic records of her history, wars, dissentions, and violent distractions, have scared away improvement, and Kúrdistán is still

—— "An unweeded garden
That grows to seed."

In ascending a very abrupt mountain, the mules had to walk literally upon the edge of a precipice, where the least false step would have consigned them to inevitable destruction: yet the confidence of the muleteers in the steady tread of these animals was such, as to make them trot on without the slightest apprehension. From the top of the mountain a most sublime and extensive view presented itself. Immediately in front of us appeared the snowy ranges of Mount Zagros towering to heaven, and beneath them several beautiful valleys and plains extended to the base of the mountain we were commencing to descend; while on either side, and in the rear, were hills of various elevation, without assuming a bare or barren appearance. Had I seen this picture of nature upon canvas, I should at once have pronounced it a production of the imagination. Here was an assembly of natural beauties, precipitous mountains, rich valleys, clear brooks, fantastic rocks, and wooded crags! Man alone has steeped it in gloom, and rendered its inhabitants a desperate people. But Kúrdish history is one of suffering, and well may I address that beautiful country in the feeling language of the poet—

Oh tu! cui feo la sorte
Dono infelice di bellezza, ond' hai
Funesta dote d'infiniti guai,
Che in fronte scritti per gran doglia porte?

Without any exception, I may safely aver that Kúrdistán is the loveliest country I ever beheld. The passes over its mountains are of the highest interest to the traveller, as they offer opportunities of observing portions of the globe, which must from their nature have been in their present state since their creation. In their recesses, he may observe from the wonderful and varied position of their stratifi-

cation what have been the operations of nature on the grandest scale. These passes are in truth the most sublime and solemn solitudes that can possibly exist, and rouse the breast of man to meditations bordering upon rapture. Uninterrupted by the intrusions of the world, he can hold converse with his God in the midst of his most awful works—

> To sit on rocks, to muse o'er flood and fell,
> To slowly trace the forest's shady scene,
> Where things that own not man's dominion dwell,
> And mortal foot hath ne'er, or rarely been;
> To climb the trackless mountain all unseen
> With the wild flock that never needs a fold;
> Alone o'er steeps and foaming falls to lean;
> This is not solitude; 'tis but to hold
> Converse with nature's charms, and view her stores unroll'd.

On arriving at the base of the mountain, we descried the wide prospect of the windings of the Bostán river, that issues from the Carducian mountains. Bostán, being interpreted, signifies the "garden," and gives its name to a small hamlet and valley situated on the southern bank of the river—a denomination well due to the whole of the surrounding country. Its hills are clothed with wood, its villages embosomed amongst trees, and its fruitful soil reminded me of countries where man is, "like a tree planted by the rivers of water, that bringeth forth his fruit in season, whose leaf shall not wither, and whatsoever he doeth shall prosper."

Independent of these lovely valleys and plains which display the most abundant fertility, the mountains in general possess a soil of considerable depth; and the wild luxuriance of unforced vegetation proves their productive qualities. The order of cultivation appears to be thus: the plains and valleys are appropriated to grain, the southern slopes of the hills form vineyards; the northern produce the oil and tobacco plants; and on the summits and inaccessible crags the goats and mountain sheep browse upon the heath, while oxen, horses, and cows, graze upon the pasture that skirts the villages. Wheat and barley are both plentiful and cheap; grapes are not so richly flavoured as the Persian, but cherries and other stone fruits are the finest I ever ate. The Kúrdistán walnut is the largest in the world, and nearly all the European fruits are very abundant. The cattle are small, but of the best breed, and so are sheep and goats. They all sell cheap, as well as horses, which are proverbial for performing the most astonishing journeys. Sir JOHN MACDONALD KINNEIR assured me, that he had ridden a distance of seventy miles over this mountainous country without once dismounting from his horse; and in June, 1828, I purchased a gelding at Bagdad, that carried me to

Tiflis in sixteen days. The distance is nearly a thousand miles! The cows yield about half a gallon of milk daily, and the sheep and goats assist to supply the dairy: cheese being always made of their milk. They use the wild artichoke to turn the milk, and their cheeses are made up into small round cakes. Their butter is well flavoured, but not of much consistency. It is churned by putting the cream into a goat's skin suspended to the side of a tent, and tossed to and fro. The Bedouins practise the same method. "Dans un peau de chévre, encore garnie de ses poils ils mettent le lait, comme dans une outre. Une femme Bedouine après avoir fortement noué les deux bouts, et suspendu le tout à une branche d'arbre, en secouant l'outre de toute sa force, parvient à faire le beurre."—(*Castellan. Mœurs des Ottomans, t. 6, p.* 60.)

Several tribes have five thousand sheep: they seldom kill any, but subsist chiefly on milk and butter. Hence, the number is continually increasing.

The Kúrdish villages, although small, are very numerous, and all built in the same style, of large unhewn stones, which have no binding material. They consist of an outer and inner room only, having a floor, and walls plastered with mud, and a roof formed by cross beams of wood, covered with reeds, or straw matting, and over that again, a thick covering of mud. They are generally seated upon the declivity of a mountain, and some idea may be formed of the steepness of their streets from this peculiarity of position, that the top of one house forms an exact level with the bottom of the one above it; and each house having a door that opens into this space; the roof of one dwelling forms a level walk for its next, or upper neighbour, where the inhabitants sit to enjoy their chibouques. We remained the night in one of these hamlets, and left shortly after day-break for the capital. After descending with great abruptness for ten miles, crossing several mountain torrents that wriggled over our track like serpents, we entered a gorge in the mountains, and commenced our ascent up the wildest mountains I had ever seen. The morning was unusually sultry; and during our journey, a dreadful storm of hail and sleet, accompanied by thunder and vivid lightning, broke upon us. We were soon enveloped in a thick mist, which brought to my remembrance the situation of the ten thousand Greeks under Zenophon, during their ever memorable retreat over these very mountains. They were hid from the enemy by a *mist* similar in density to the one we here experienced; for it was with difficulty we could at times discern objects at ten yards' distance. Having reached a considerable height, a sublimely vast extent of

mountain, ravine, and glen lay exposed to our glance; but were quickly obscured by the passing clouds. It was now easy to discover, without the help of any barometer but that of our own feelings, that we had reached a great elevation—a fact which was proved by the successive risings of hill over which our road was directed. Still ascending, we came to the extreme summit, from whence we saw the city of Sulimániah marked by trees in a nook of the mountains. It appeared beneath our feet, although we were full ten miles from it. In fact, from this lofty pinnacle, we seemed to descry at once "all the kingdoms of the world, and the glory of them." Our descent was one of extreme difficulty; but our eyes were delighted with the general aspect of the valley below, and the situation of Sulimániah at the end of it. The hills by which it was surrounded on all sides were sufficiently broken in their outline to be picturesque, and the plain which skirted them at their feet was clothed in the richest verdure. The grain-fields assumed a lovely appearance; the gardens occupying distant portions of the valley, and a stream meandering through it, gave such a luxuriance to the picture, as to unite beauty with fertility, and wealth with usefulness.

On nearing the city, a mound of considerable magnitude rises on the left of the road, which nearly resembled the *tumuli* of Greece. It is not improbable that the spot may mark the tomb of some Greek general. Many similar may be seen in Kúrdistán, which nearly resemble those in Wiltshire. Indeed, such remains of antiquity are spread over the whole surface of the globe.

Sulimániah, or Sulimáney, the Shehrazour of the ancients, is most romantically situated on the northern bank of the river Diála, in a deep valley, irregularly formed by the bases of the Carducian range, which, covered with forests of oak, and clothed in snow to its summit, entrench it on every side. Its geographical position is 35° 30′ north latitude, and 44° 45′ east longitude. During the retreat of HERACLIUS this city was distinguished by the name of Siazuros, and not far hence was the city of Holwán, the retirement of YEZDEJERD after the battle of Cadesia, a spot to which the Khalifs of Bagdad resorted during the summer season. It was ruined by HULAKO, and has never since recovered its consequence.

Sulimániah is an unwalled town: its houses are built extremely low, which gives them a mean appearance, though doubtless they are better secured against the snows and cold of this elevated region. The streets are narrow, and run irregular; and there are neither good bazars nor fine mosques to relieve the dull monotony of the common buildings. The houses are mostly built of unhewn stones,

plastered over with mud; though some few are constructed with bricks. The climate is said to be very fine, and the inhabitants, who approach to the number of 20,000, are robust and active: their aspects forbidding, their expressions of countenance harsh, and their complexions dark. The government of Sulimániah is in the hands of a Pasha, who is by birth a Kúrd, and subject to neither Turks nor Persians. His name is SULEMÁN, and he is highly popular and very indulgent. For the purpose of pleasing the Russians, he sends an annual present in cash to ABBÁS MIRZA, who the northern barbarians hope will soon employ their officers in preference to those of the English. Count PASKEWITCH is desirous of taking the Kúrds under his *especial* protection, that in case of need, they may harass by their sudden and repeated incursions the inhabitants of those countries by which they are bounded. For such a duty they are eminently fitted. The military force for the defence of the town does not exceed 2000 men. About a fourth of that number are frequently in attendance at the palace, which is the Pasha's residence. It is a mean and ruined pile, composed of spacious courts and extensive inclosures. The trade of Sulimániah is in a very declining state; there are only two or three Armenians, agents for some Bagdad merchants, who receive gall-nuts in exchange for a few Indian commodities, which come up by the way of Bussorah.

Nothing is known of the history of Sulimániah. M. NIEBUHR visited this part of the country in the year 1769, and found the people subject to a sort of feudal government. They are imagined to be the Carduchai of ZENOPHON, and their national character has descended unchanged from time immemorial. KINNEIR has made Sennah, which is situated about ninety-five miles to the eastward, the capital; but the Wály or chief of that town is a mere creature dependent upon His Majesty of Persia, to whom he transmits a handsome sum annually. The father of the present Wály was a man of great power and independence; but he became deranged, and unfortunately, madness would seem to run in the family, as his son has given ample proofs of it.

Sulimániah is an extensive place, and forms a central emporium to the neighbouring tracts of cultivation. The country which surrounds it is charming; the soil gravelly, as far as its immediate vicinity; when it becomes more sandy, and of a light loamy nature. The rich appearance of the wheat and barley I have already noticed, the green at this time was most beautiful. We found the tillage of the district excellent; the fields being neatly divided into square compartments, for the benefit of irrigation.

Being the bearer of a letter for the Pasha, he assigned me a house in the best part of the city, and I found the people both civil and obliging. They pretend to pique themselves upon hospitality, but how its duties are discharged, will depend entirely on circumstances. For instance, in the year 1828, habited as a Turk, I travelled through Kúrdistán in company with a man who pretended to be a lineal descendant of the prophets; and we journeyed a distance of six hundred miles, halting at this city on the way, without spending the sum of ten Persian rials. The Seyad afterwards assured me, that he was offered a wife at every village through which we passed; but, added he, "as I was your Mehmándár, I could not act with such indecorum." However, he actually had a wife of his own, at every town of note between Bagdad and Tabríz. This man's name is ISHMAEL; he has often served English travellers, and has always given infinite satisfaction. At the time I am now writing, I have not disguised myself, but am in the costume of my own country; the consequence is, I find travelling here more expensive than in Persia. Nevertheless, I would advise all travellers who care not for the expence, and have plenty of spare time, to pass hence in their own dress; for their persons are respected, and in security: whereas, by adopting a foreign garb (although better opportunities are afforded of observing the people and country), a traveller might be murdered for the value of a decent pair of shulwárs *(breeches)*. My own life was attempted more than once at the time I have just referred to, but, now I feel as secure as if I were passing through Regent Street.

Amongst those tribes whose morals have been vitiated by habits of rapine, it is unsafe to trust to the strongest professions. For there can be no doubt that cruelty and avarice characterize this people, though they by no means hoard their money; always preferring to convert it into horses, mares, lances, pistols, swords, and ornaments for their women. Cash is not very current amongst them, purchases being made by barter. In all my travels I never could procure change for a sum equivalent to a rupee.

The females are not shut up in this or any other Kúrdish town; nor are they veiled, like those of most Muhammedan countries. On entering the house of a Kúrd, you are not annoyed by women rushing in every direction to escape notice. During my stay amongst them, I constantly met women in company with men, without veils. It is true they are not permitted to eat with the men, but in every other respect they are entirely free. As far as my own observation extended, they were not possessed of those personal charms which might impose the necessity of restraint, though a few of them, if

dressed up in the Parisian fashion, would be considered pretty brunettes; their complexions were not so dark as to veil their blushes. They were generally small and well made, and had large dark eyes, the appearances of which they take great pains to show off to the best advantage. They dye their eye-brows with a collyrium called in the Arabic "*khattat*." It is reduced to a fine powder. The eye-lids are painted with the "*kahel*," and the lashes blackened with a reed, which is passed between the eye-lids. The angles of the eye are also tinged and prolonged, which makes it appear much larger. The ancient Egyptian ladies, as well as the modern Persian, are represented as having resorted to the same arts of the toilette. Juvenal admirably satirises the Roman ladies for this coquetry.

> "Illa supercilium, madida fuligine tartum,
> Obliqua producit acu, pingitque trementes
> Attollens oculos."—(Juv. Sat. ii. 1. 93.)

Another fashion equally essential to Kúrdish beauty, requires that the nails of the hands and feet should be stained with henna; and so very general is this custom, that any woman who should hesitate to conform to it would be considered immodest. The soles of the feet are likewise daubed with the same coloring. The fingers are sometimes partially painted; and to prevent the henna taking every where, the fair artists twist tape round them before they apply it, so that when the operation is completed, their fingers are fancifully marked with orange-colored stripes, which is by no means improving to a fine hand. In fact, the delicate whiteness of the palm, and the rose color of the nail, is utterly effaced by this dye.

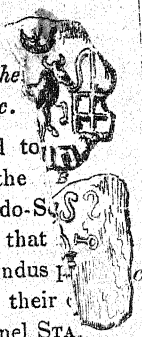
In a large town like Sulimániah, it is not to be supposed that the women enjoy the same degree of liberty as they do in villages; indeed, they are often much watched; and in the marriage contract, it is insisted that the bride shall exhibit those proofs of her innocence, which afterwards she is expected to confirm by her conduct. In fact, a bride would be returned to her parents, should she be unable to produce the testimonials of her virginity. I have certainly seen them very familiarly inclined, but I was told they are not backward in assuming the semblance of enticement, that the incautious stranger may proceed to improper liberties, upon which these artful females accuse the unhappy guest of freedom and insult; when their male relations seize upon his baggage, and otherwise molest him.

In their mode of life, the Kúrds are habitually abstemious, subsisting on the coarsest rye-bread and manna; and when meat is introduced at their meals, it has seldom undergone any further culinary preparation than that of boiling in plain water. Some travellers have

spoken of their personal cleanliness, but on this point I certainly cannot agree with them. In regard to cleanliness, none of the Asiatics can be compared to ourselves. Their repeated ablutions very imperfectly remove the evils attendant on the length of time they wear their clothes. I speak from an intimate acquaintance with the practices of Muhammedans in general. Circumcision is supposed to contribute to cleanliness, and is not confined to our sex alone, as the girls of many tribes undergo an operation somewhat similar just before they reach the age of ten. I am ignorant of the manner in which it is done, as the natives are not very communicative on such subjects; but there are women who live by the performance of it. The barbers operate on the males, and are esteemed unclean from the profession they exercise.

The Kúrds have a practice of removing all the hair from the parts of the body, where we suffer it to remain; and where we carefully shave, they as carefully cherish its growth. The women also practise depilation in the following way: A thin cord is dipped into some particular gum, and drawn slowly over the parts, when it removes all that adheres to it. This process is extremely painful; but the remedy does not require a frequent recurrence, as it either produces a complete eradication, or if a new growth appears, it is merely a soft down, which may be removed with facility.

Another remarkable contrast between European and Asiatic taste is, that corpulence and bulkiness form the greatest trait of beauty. It is natural enough, therefore, that the females are desirous of acquiring a superiority in this particular. They accordingly eat a great variety of sweetmeats, candied fruit, and particular vegetable substances, grated down, and mixed with conserves. This latter composition is thought to be adapted both for vigour, and that *en bon point*, which is so delightful to their admirers. A Kúrd of some rank, in describing the charms of his intended bride, said to me with much seriousness—"She is as large as an elephant!"—He considered this comparison the very acme of perfection.



III.—*On the connection of various ancient Hindu coins with the ... or Indo-Scythic series.* By James Prinsep, *Sec. &c.*

In my last notice on the subject of coins, I promised to ... forward demonstrations *in kind*, of the direct descent of the ... coins of Kanouj, from what have been denominated the Indo-S... series. In attempting to redeem my pledge, I am aware that ... counter to the opinions of those who maintain that the Hindus ... tised the art of coinage, and had a distinct currency of their ... before the Greeks entered India; especially my friend Colonel Sta... To him my opposition might appear the more ungracious, since ... weapons I am about to use are chiefly those he has himself so gene... ously placed in my hands; but that I well know he is himself on... anxious to develope the truth, and will support a cherished theor... no longer than it can be maintained with plausibility at least, if no... with proof.

I am not, however, about to contend that the Hindus had no indigenous currency of the precious metals. On the contrary, I think evidence will be found in the collection about to be described, that they circulated small pieces of a given weight; that stamps were given to these, varying under different circumstances; and that many of these earliest tokens exhibit several stamps consecutively impressed on the same piece, until at last the superposed impressions (not those of a die but rather of a punch) came to resemble the devices seen on the Indo-Scythic coins, in company with which they have been found buried in various places, particularly in Captain Cautley's Herculaneum at *Behat* near Saháranpur.

That from this period, in round terms, may be assumed the adoption of a *die-device*, or of coined money properly so called, by the Hindus, is all I would venture at present to uphold; and in doing so, I will not again appeal to the assertions of Pausanias*, quoted in Robertson's disquisition, that the Hindus had no coined money of their own; nor to the silence of the Mahábhárat and other ancient works on the subject; but solely to the close family resemblance of four distinct classes of Hindu coins to what may be called their Bactrian prototypes; namely, those of *Kanouj*; the later class of the *Behat*, or the Buddhist, group; the coins of *Saurâshtra*, found at *Ujjain*, in *Guzerát* and *Cachha*; and those which Colonel Stacy has denominated *Rájput* coins, having the device of a horseman on one side, and a bull on the other.

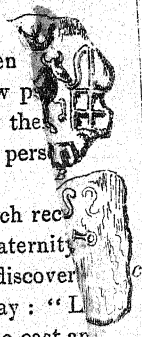
Before proceeding to comment upon the first of these classes, my tribute of obligation and praise is due to Colonel Stacy, for the

* See J. A. S. vol. i. page 394.

spoken ring labour and true antiquarian zeal, which have alone cannot l him to gather together such a rich collection of this peculiar Asiatic re type, and for the disinterested readiness with which he has very in them at my disposal, to select from and publish at once, they w depriving him as it were of the first fruits of his enterprize and the p It is true that so far at least as regards the merit of discovery, to c title will rather be confirmed than injured by early publicity; the the employment of another hand to illustrate his materials may do bef justice to his own careful classification; and modify the opinions and wh ductions regarding the origin, connection, and antiquity of various sul oups, which he may have derived from a larger and more intimate Thudy of the subject, and from the actual inspection and handling of th housands of coins, that have been withheld from insertion in his elect cabinet.

o The home collector, who like myself, but receives contributions s from others, may learn, from the superior fulness and novelty of t many of the following plates, to appreciate the advantage of per- s sonal exertion over second-hand acquirement. In further proof of this, I could produce some of the letters now lying before me, re- ceived from Colonel STACY on his several coin excursions. Here he would be seen putting up with every inconvenience, enduring the burning heats of May, or the cold of December, under trees or in common serais in Central India; digging in deserted ruins, or poring over the old stores of village money-changers, after having (the principal difficulty and art), won their confidence, sometimes their interest, in the object of his pursuit: sparing neither money nor time to gain his end, and after a hard search and fatigue, sitting down, while his impressions were still warm and vivid, to communicate the results of his day's campaign.

Col. STACY felt himself for a moment disheartened on beholding the treasures of Gen. VENTURA and his followers: but although the character of the Bactrian relics necessarily eclipses all that can be expected from a Hindu source, while their prolific abundance astonishes the gleaner of Hindu relics, a moment's reflection should restore a full or even increased degree of satisfaction. Hindu history is even more in need of elucidation from coins than Bactrian. The two countries are in fact found to be interwoven in their history in a most curious manner, and must be studied together. The alphabetic characters, the symbols, and most especially the *link-coins*, (emphatically named so by Colonel STACY,) are fraught with information on this head, which can only be extracted by multiplying the specimens, and thus completing the chain of evidence. It will be seen shortly, that



several of the dynasties to which the coins belong have been fied through the names and legends they bear, and many new p hitherto unheard of, have been brought to light. Let not the Colonel Stacy desert his line for one more engaging, but pers in it as long as anything remains to be explored.

I cannot resist in this place pointing out the line of search rec mended by Colonel Tod, (to whom is justly ascribed the paternity this branch of numismatic study,) in a note on the late *Panjáb* discover published by him in the Asiatic Journal of London for May: "L not the antiquary," he writes, "forget the old cities on the east an west of the *Jamna*, in the desert, and in the *Panjáb*, of which I hav given lists, where his toil will be richly rewarded. I possess bags ful of these Indogetic gentry; and I melted down into several sets o basons and ewers, the rust of ages from which the tooth of time had eradicated whatever had once been legible.... I would suggest the establishment of branch-committees of the Asiatic Society at several of the large stations, which would have a happy moral result in calling forth the latent talent of many a young officer in every branch of knowledge within the scope of the Society. *Agra, Mathura, Delhi, Ajmír, Jaipur, Némuch, Mhow, Ságar*, &c. are amongst the most eligible positions for this object .... A topographical map, with explanations of ancient Delhí, is yet a desideratum, and of the first interest: this I had nearly accomplished during the four months I resided amidst the tombs of that city."

In thanking Colonel Tod for his encouragement and advice, I must be allowed to differ altogether as to the means to be employed. Committees are cumbrous, spiritless, and inactive engines, for such an end; when anything does appear to be effected by them, it is generally the work of one member, whose energy is only diluted and enfeebled by the association. Give me rather the unity of design, and quickness of execution of (I will not say agent, as Colonel Tod suggests, but of) an independent pursuer of the object for its own sake*, or for his own amusement and instruction. It is by such as

* These I may say are already provided at more places than Colonel Tod points out: Colonel Stacy at *Chitor*, *Udayapur*, and now at *Delhí*: Lieutenant A. Conolly at *Jaipur*; Captain Wade at *Ludiána*; Capt. Cautley at *Seháranpur*; Lieut. Cunningham at *Benares*; Colonel Smith at *Patna*; Mr. Tregear at *Jaunpur*; and Dr. Swiney (now in *Calcutta*), for many years a collector in Upper India. And for the exterior line, Lieut. Burnes at the mouth of the Indus; Messrs. Ventura, Court, Masson, Kera'mat Alí and Mohan La'l in the *Panjáb*; besides whom I must not omit Messrs. H. C. Hamilton, Spiers, Edgeworth, Gubbins, Capt. Jenkins, and other friends who have occasionally sent me coins dug up in their districts.

spoken that all the good has hitherto been done; the extension of cannot age followed rather than preceded or prompted the great disco- Asiatic of last year in Kábul*.

very in plates I have prepared to illustrate my subject have not been they were in the most convenient order for the purpose; but as it is a the per of indifference which line we commence upon, it will be fair to to co our first attention to Plate XXXIV. containing the so long post- the ied continuation of the coins and relics dug up by Capt. CAUTLEY bef Behat, and noticed in the Proceedings of the Asiatic Society on whe 14th January last.

su The exhumation of this subterranean town has not perhaps been Tollowed up with so much vigour as it would have been, had not its thiscoverer's attention been diverted to other antiquities of more overwhelming interest—the fossil inhabitants of a former world—be- fore which the *modern* reliques of a couple of thousand years shrink into a comparative insignificance. Perhaps indeed the notion of a city at the spot indicated by these remains should be modified. Professor WILSON writes me, that he cannot suggest any ancient city of note so situated; yet if it existed so late as the 3rd or 4th century of our era, it ought surely to be known. It may probably have been the site of a Buddhist monastery, which became deserted during the persecutions of this sect, and was then gradually destroyed and buried by the shifting sands of the hill torrents. Some of the relics now to be noticed forcibly bear out this supposition.

Plate XXXIV. Behat Group.

The upper half of this plate contains a continuation of the relics dug up at *Behat* by Captain CAUTLEY.

Fig. 1 is the object of principal interest, because it stamps the locality as decidedly Buddhist, and leaves us to infer, that the coins are the same, although their devices have nothing that can be positively asserted to be discriminative of this sect. The figure represents two fragments of a circular ring of baked clay. In the inner circumference are carved or stamped, a succession of small figures of BUDDHA seated, apparently 12 in number; and on the upper surface, a circular train of lizards. It is difficult to imagine the purpose to which it could have been applied. In some respects it may be compared

* We have arrested the press of this sheet to announce the arrival of the second memoir by Mr. MASSON, on the produce of his labours at *Beghram*—the same announced some time since by Captain WADE. We shall hasten to prepare lithographs of the numerous figures with which it is illustrated, although comparatively few (not more than 5 or 6) of them are altogether new after Gen. VENTURA'S collection.—ED.

Jour. As. Soc.

Relics from Behat near Seháranpur.

To Srirangapattam

to the semi-circular sculpture near the *Bo*-tree at *Anurádhapura* in Ceylon, depicted in the 3rd volume of the Royal Asiatic Society's Transactions; but, in that, the ring of animals consists of elephants, horses, tigers, and bulls, alternately*; four animals, which have a place in the *Bauddha* mythology; whereas I am not aware that the lizard is regarded in any degree of reverence by the Buddhists.

Fig. 3, an old ring of copper. This, like the more ornamental ring of Plate XVIII., volume 3rd, may in some respects be looked upon as a *Bauddha* relic; for in its metal it accords well with an extract from the *Dulva* in M. Csoma Körösi's Analysis of the Tibetan Scriptures, containing *Shákya's* injunctions that his priests should only wear seal-rings of the baser metals. "Priests are prohibited from wearing *rings*, and from having seal-rings of gold, silver, or precious stones; but they may have seals made of copper, brass, bell-metal, ivory, horn. A man of the religious order must have on his seal or stamp a circle with two deer on opposite sides; and below, the name of the founder of the *Vihara*. A layman may have a full length figure, or a head, cut on his signet."—Leaf 11, 12, volume X. of the *Dulva*—Asiatic Researches, xix. 86.

The circular devices of some of the coins (23 of this Plate, 31 and 32, of the following,) may perhaps also be explained by the rule of this teacher cited in the same extract, that the priests should use no other impress than that of the circle; and it is remarkable, that the deer is the very animal found on the most prominent silver coins of the group, such as fig. 16 of the present plate, and 48 of Plate XXXV., (see also volume iii. pp. 227 and 434.)

Fig. 4. A small image of baked clay; is more like a plaything for children than an object of worship.

Figs. 5, 6, 7, 8, 9, 10, are varieties of the peculiar coins of the *Behat* series already noticed in Plate XVII. of volume iii.

The characters in many are tolerably distinct, and are clearly allied to, if not identical with, those of fig. 22—a true descendant of the Kanerkos series, as will be presently shewn in my Indo-Scythic Plate, LI., figs. 16, 17, (q, v.) The emblems also on many, a bull

* "At the foot of the steps to this second building, and let into the ground, is a very remarkable slab of hard blue granite: it is semi-circular, and sculptured in rings or bands of different widths. Some of the patterns are scrolls, equal in beauty to any thing Grecian; one consists of the *Hansa* or *Bráhmana* duck, bearing the root of the Lotus in its bill; and the most curious has figures of the elephant, the horse, the lion, and the cow, which are repeated in the same order, and sculptured with great spirit and accuracy of outline."—*Roy. As. Soc. Trans. III.* 467.

and an elephant, may be imitations of the Azos coin. In fig. 7, the 𐨟 symbol is exactly a *Chaitya*, or Bauddha monument, as I had from the first supposed.

The tree is also satisfactorily made out in fig. 15, and in many of the coins in the following plate. In fig. 23, it is seen at the side of a walking figure; and above it, in a very perfect coin of the same type, since sent to me by Lieut. CONOLLY, the sun shines,—as it were on the saint and his holy tree.

The three most conspicuous letters on all of these coins are 𐨬𐨯𐨬 or *y dh y*, and it does not seem any great stretch of imagination to see in them a part of the word *Ayodhaya*, the seat of one of the earliest Hindu dynasties, and which was at the commencement of Buddhism almost as much the resort of its founder SHÁKYA, as *Rájgriha* the capital of *Magadha*. Still from the association of these coins with those of the Indo-Scythic dynasty, it would be hazardous to attribute to them any greater antiquity than the early part of the Christian era.

The metal of these coins is a mixture of tin and copper, which retains its figure well, and is white when cut.

Figs. 11, 12, will be recognized as Indo-Scythic coins: being found along with the rest, they serve to settle the point of antiquity.

On fig. 13, are the letters 𐨤𐨪𐨣 (in Tibetan 𑖪𑖨𑖕𑖿𑖦..) *p rája s.*

On fig. 16, are a further supply resembling more the *láth* alphabet 𐨨𐨫𐨬𐨯𐨭.. *a mapasáte* . . . The same combination occurs in fig. 45, otherwise so different a coin; on the reverse, the letters under the symbol very much resemble the Pehlevi 𐭩𐭫𐭪𐭬 *malakáo*. This silver coin is of M. VENTURA's collection.

Fig. 17, is peculiar for its multitude of symbols, most of them known to us by their occurrence on other coins. This specimen is also of the VENTURA collection.

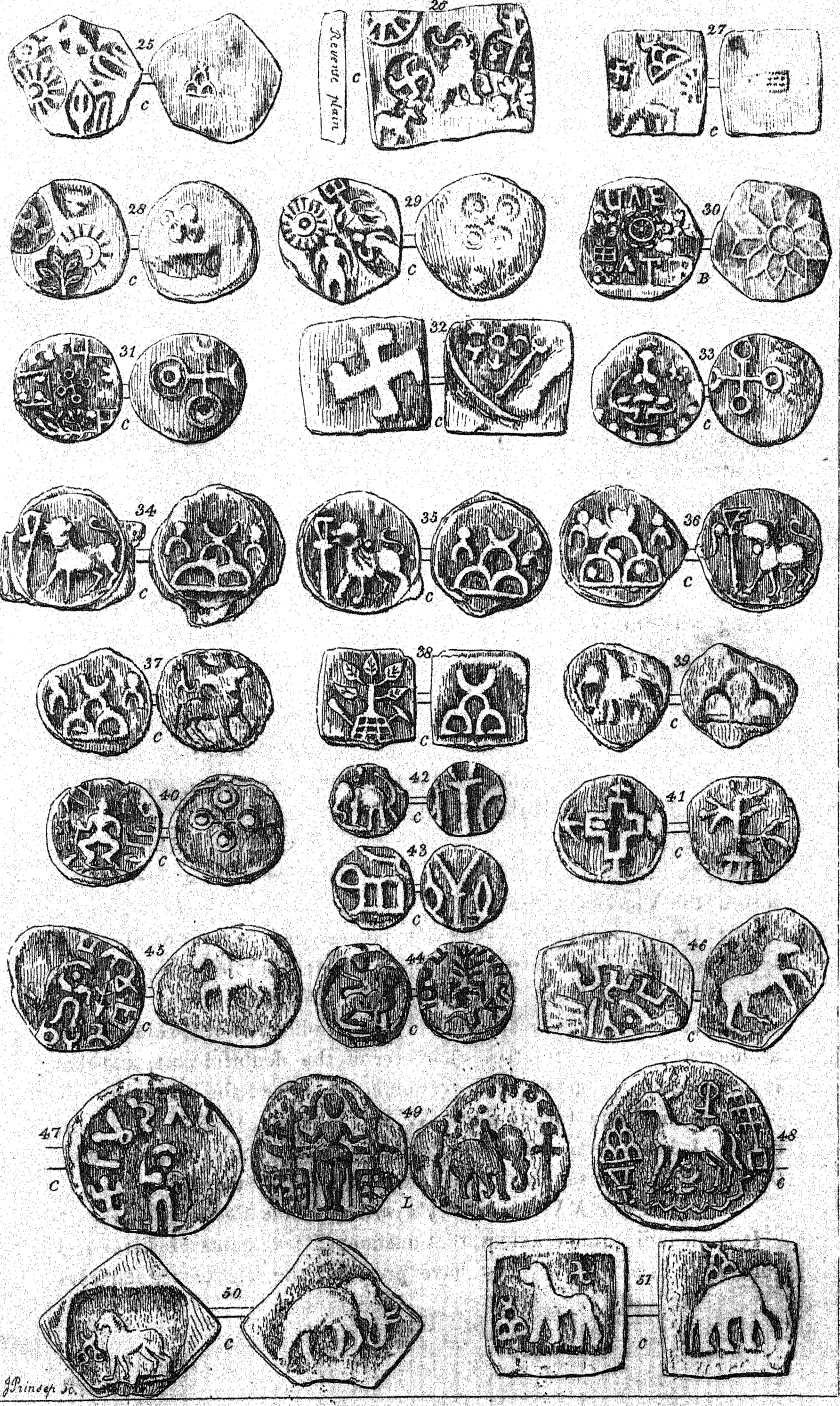
Fig. 18, a coin in Mr. TREGEAR's possession. Several of the same kind have been before introduced into my plates, but hitherto the figure under the elephant has been supposed to be a prostrate elephant vanquished by the upper animal. The multiplication of specimens has at length shewn us the true character of the doubtful part, and that it merely consists of two of the common symbols of the series.

But we must now turn to Plate XXXV. in which, thanks to Colonel STACY, I have been able to attempt a more methodical classification from his abundant supply of this Buddhist series of coins.

Plate XXXV. Stacy's earliest Hindu Coins.

It is an indisputable axiom, that unstamped fragments of silver and gold of a fixed weight must have preceded the use of regular coin

Ancient Hindu Coins.



J. Prinsep Sc.

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in those countries where civilization and commerce had induced the necessity of some convenient representative of value. The antiquarian therefore will have little hesitation in ascribing the highest grade of antiquity in Indian numismatology to those small flattened bits of silver or other metal which are occasionally discovered all over the country, either quite smooth, or bearing only a few punch-marks on one or both sides; and generally having a corner cut off, as may be conjectured, for the adjustment of their weight*. Many instances of this type have been given in Col. MACKENZIE's collection, (figs. 101 to 108 of WILSON's plates) who describes them as "of an irregular form, bearing no inscription, occasionally quite plain, and in any case having only a few indistinct and unintelligible symbols: that of the sun, or a star is most common; and those of the *lingam* (?) the crescent, and figures of animals may be traced." The Colonel's specimens were chiefly procured in South India: others have been dug up in the Sunderbans:—and many were found at *Behat* (fig. 14.)

But the few selected specimens in Col. STACY's collection, (figs. 25—29) yield more food for speculation than the nearly smooth pieces above alluded to. On all these we perceive the symbol of the sun to be the faintest of those present: in two instances (figs. 28, 29) it is superposed by symbols which may be hence concluded to be more recent. These are severally, the 𑀘 *chaitya*, the tree, the *swastika* 卐 and the human figure; besides which in fig. 26, we have the elephant, the bull, and the peculiar symbols of figs. 34—37. They are all stamped on at random with punches, and may naturally be interpreted as the insignia of successive dynasties authenticating their currency.

In one only, fig. 30, does there appear any approach to alphabetic characters, and here the letters resemble those of the *láths*, or of the caves on the west of India, the most ancient written form of the Sanscrit language.

From the above original seem to have descended two distinct families, of which one was produced by the hammer and die, the other by casting in a mould. Of the latter, easily recognizable by the depth of relief, the projecting keel on the margin, shewing where the moulds were united,—and the greater corrosion due to the softness of the cast metal,—we have various groupes, and sub-divisions, but most of them agree in bearing the 𑀘 monogram for their obverse; sometimes, as in figs. 34, 35, 36, 37, with addition of two smaller symbols, ♌, like the sign of Taurus reversed.

* Their average weight is 50 grains, or the same as the *tan̆k* (= 3 *máshas*) of the ancient Hindu Metrology. Indeed the word *tan̆k-sâla*, mint, goes far to prove that these are the very pieces fabricated for circulation under that name.

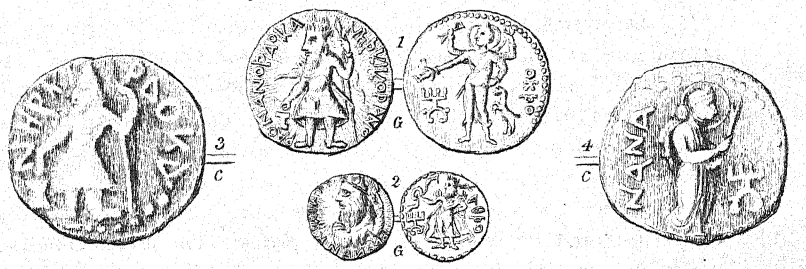
On the reverse, we have frequently a dog with a collar (and bell?) guarding a sword or flagstaff of victory, (*jaya dhvaja?*) figs. 20, 21, 34, 35, 36. At other times an elephant (fig. 39); a bull (37), or the sacred tree (15, 38): and, in rarer cases, the device on both sides is changed, as in 40, 41. Figs. 18, 42, and 43, (in the latter of which the elephant might easily be mistaken for a deva nágarí letter,) are of the cast species; to which also belongs the multi-symbolic coin, fig. 18, of the last, and its fellows of former plates. The leaden coin 49, is also cast, but it is probably a forgery of some copper original.

Of the second branch, or die-struck coins, we have also several subdivisions—1*st*, the peculiar bronze-metal *(Ayodhya?)* coins of Behat in the last plate; to which belongs 44, with the tree symbol, and a sitting dog on the obverse: 2*nd*, a groupe, (figs 45, 46, 47,) having a horse on one side, similar to Lieut. CONOLLY's coin, fig. 1, Pl. XXV. of vol. iii.; 3*rd*, the stag and *chaitya* coin, (figs. 16, 48; also figs. 1, 2, and 6, of Pl. XVIII. and fig. 4, of Pl. XXV. vol. iii.); and 4*th*, those square rude coins, first pointed out by MASSON, having an elephant on one side and a lion (dog) on the other, with the characteristic symbol ⁂ figs. 50 and 51, of this kind are from the VENTURA collection.

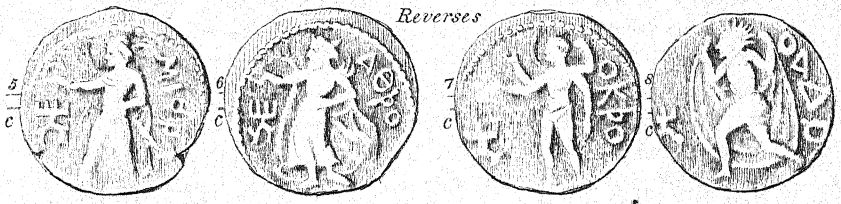
Upon most of the latter or die-struck species are portions of inscriptions in the *láth* character, as was first clearly determined from Lieut. CONOLLY's coin, (Pl. XXV. vol. iii.) The letters so well defined on that type coin may be read, विद्हेवस, *vidáhévasa;* the second in the list there given was converted into तपसलच्छ; the third into भगवतरूप: but such renderings, having nothing beyond their being real Sanscrit words to recommend them, are hardly admissible. In the same manner, nothing can be made of the combination *patama dásata* of fig. 45; *pasaha* of 46; or *ramahata* of 47: the last coin is curious, from having an alligator or lizard symbol, similar to the sign on the porcelain ring from Behat (fig. 1.)

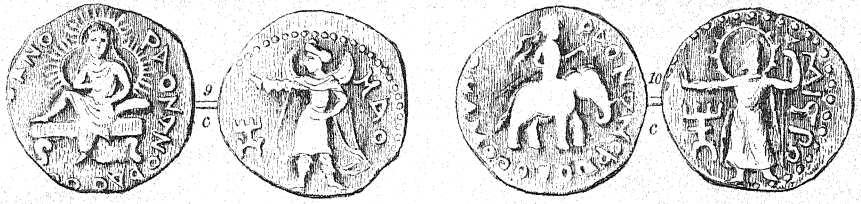
In explanation of the absence of any of the titles of sovereignty in these legends, the quotation already cited from M. CSOMA's analysis of the *Dulva* may be again brought forward—that under the symbols of the circle, deer, &c. the name of the founder of the *Vihara* should be inscribed;—indeed the whole of the above passage is singularly applicable to this group of coins; and, in conjunction with other evidence, suggests the idea that the Buddhist coinage was struck in the monasteries of the priesthood, where the learning, skill, and riches of the country would naturally follow their attainment of influence, and ascendancy over princes and people. The same argument may account for the imitation of Bactrian or Indo-Scythic

Indoscythic Coins - Kanerkos group.

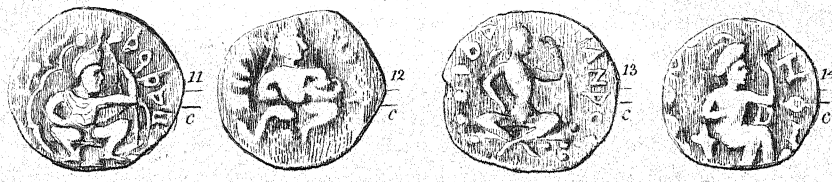


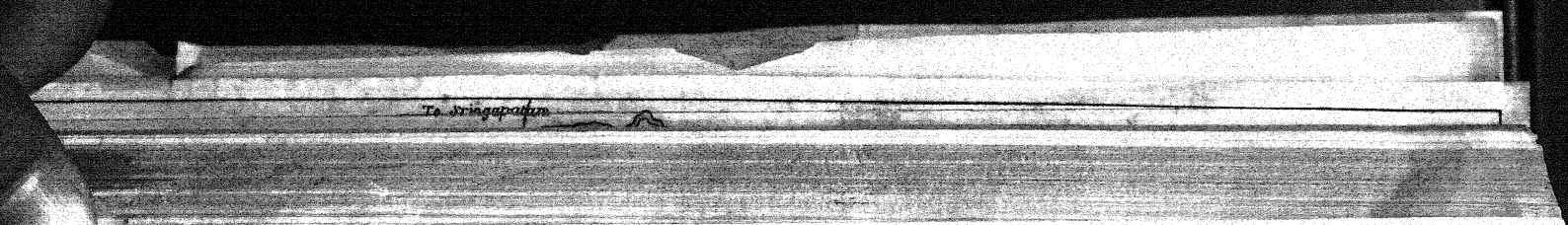
Reverses





obverses




To Sringapatam

devices in the later coins of the series; since it is well known, that Buddhism prevailed through these countries also, and a constant intercommunication must have been consequently kept up. How far the antiquity of the first Buddhist groups of coins may have approached the epoch of BUDDHA (544 B. C.) it is difficult to determine, but the acquisition of their similitude to the Indo-Scythic coins must have been posterior to the breaking up of the genuine Bactrian dynasty, perhaps about the commencement of the Christian era.

Plate LI. Indo-Scythic Coins resumed.

Having disposed to the best of our knowledge of the earliest Hindu coins, we must now return to the Indo-Scythic series, for the purpose of conducting the reader through the promised line of connection into the second great field of Hindu imitation.

Enough has been said on former occasions of the two principal families of this type, the KADPHISES and the KANERKOS groupes; but with a view of systematizing a little the information already obtained; and, at the same time, of introducing a few new and very beautiful coins lately added to our list, I have collected in the present plate the principal varieties of the KANERKOS *mithriacs*, subsequent to the adoption of the vernacular titles *rao* and *rao nano rao*.

With the most common obverse of the Indo-Scythic family, a raja clad in the Tartar coat and inscribed PAO KANHPKI, fig. 3, I have traced on the copper coins, as well as in the gold ones, the following series of reverses, NANA (for *nanaia*), NANAO, MAO, MIΘPO, MITPO, MIOPO, MIPO, AΘPO, OKPO, and a word not very clearly made out on fig. 8, OAAO. Of these, the explanations have been already attempted*; *mithro*, *mitro*, *miro*† are but varieties of *mithra*, the sun, whose effigy on the genuine Greek coins of KANERKOS is plainly entitled HAIOΣ. *Okro* I have conjectured to be intended for *arka*, the Sanscrit name of the sun; and his four-armed effigy in fig. 7, more beautifully developed on the gold coin fig. 1, an unique obtained by KERÁMAT ALI at Cábul, confirms this opinion. *Athro* has been before stated to be the Zend word for the igneous essence of the sun, and accordingly, we find flame depicted on the shoulders of the figures bearing this epithet, in fig. 6, and in fig. 2, a very pretty little gold coin, for which I am also indebted to KERÁMAT ALI. *Nanaia*, remaining feminine in NANA of fig. 4, has been shewn to be the Persian *Diana*, or the moon:—and in strict accordance with the Brahmanical mythology, this deity is made masculine in NANAO and MAO, the *más* or *lunus* of the Hindus,

* See vol. iii. p. 452, et seq.

† Lieut. CUNNINGHAM has added this variety from a fine gold coin.

and on his effigy in figure 9, (as in former drawings in vol. iii.,) the horns of the moon are seen to project from behind his shoulders.

The same devices in every respect are continued upon several succeeding coins of the *Rao nano rao* series. The chief varieties of the obverse of these are given in figs. 2, 9, 10, 11, 12, 13, 14. The order in which they should be placed is necessarily doubtful; but judging from the comparative perfection of the Grecian letters, the "couch-lounger," fig. 9, and the "elephant-rider," fig. 10, should have precedence over the rest.

Fig. 9, from the VENTURA collection, is a very perfect specimen of the couch-lounger. He has a glory extending around his body, as well as his head, and his titles, *rao nano rao* and *korano*, are distinct; but the name is unfortunately missing, no more than O O being visible.

In fig. 10, we are not more fortunate, but from the succession of *o's*, we may guess the word to be OOHMO or OOHPKI, names already known on the gold coins. Some of the Manikyála elephant coins had the name KEN PANO. This family is extremely numerous, and is procurable among the old pice of every bazar in Upper India.

The names on the last series, figs. 11 to 14, are illegible; but the letters are still Greek. The three first specimens are selected from a number in Col. STACY's cabinet, to exhibit the varieties of the sitting posture, and its gradual transition to the squat position of the Hindus. Col. TOD has supposed the figure in a coin similar to fig. 11, to be Parthian; but what he there took for a bow was evidently the ornamental contour of the back of the prince's throne or *sinhásan*. Fig. 14, is from a coin in Col. SMITH's possession.

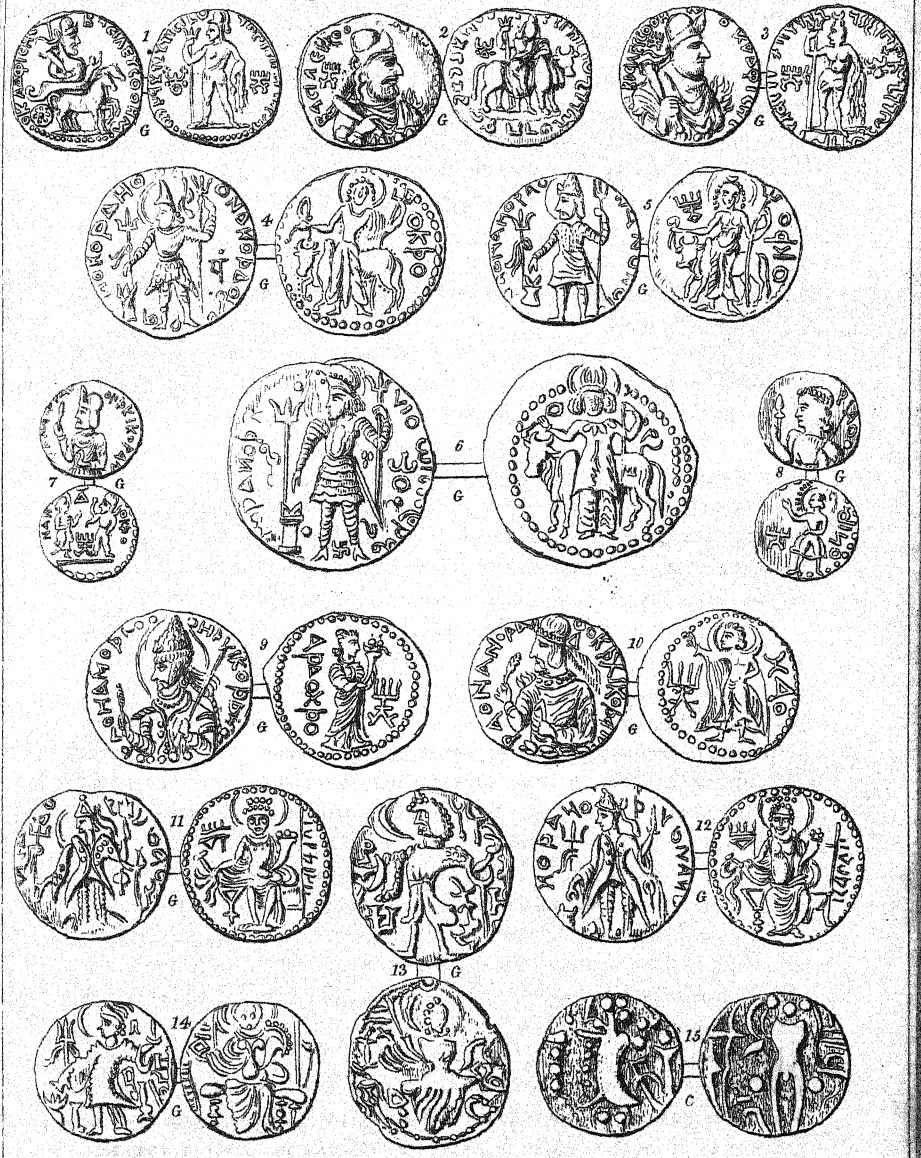
In fig. 15, of this plate, drawn from a plaister cast of a bronze, embossed, *chaprás* or badge in the VENTURA collection, we may conceive the full device of the elephant obverse to be developed. The faulty proportion of the rider still prevails:—the flowing fillets to the headdress; the *ankush* to guide the animal; the glory around the face, are visible in both; but the name is wanting.

Of figs. 16 and 17, the former from Col. STACY's, the latter from Col. SMITH's, cabinet, I have already noticed a less perfect specimen while descanting on the earliest Hindu coins. The general style of the figures on both faces so strongly resembles that of the KANERKOS coins, that I feel disposed to look upon them as imitations. The legend has a fourth letter very distinct, besides some less distinct on the left hand, यौधेय नस्य *yodhíyala. . tajaya.*

Plate XXXVIII. Indo-Scythic and Hindu Link-Coins.

It is worthy of remark, that none of the KANERKOS coins have a Pehlevi legend; although the collateral series of KADPHISES, which

Connection of Indo-scythic with Canouj Coins.



Hindu Coins. Canouj Series.

J. Prinsep sc.

To Srirangapatam

possesses so many attributes in common with them, invariably has this accompaniment. Considering that all the Bactrian family have the same, it would perhaps be better to place KADPHISES as the last of the *Pehlevi* series, immediately *before* KANERKOS*, and he will thus follow most conveniently the *Kadaphes choranos* described in my last paper. Indeed, as the word *Kadphises* never occurs except in conjunction with some other name, as OOHMO, or OOKMO, it may be read as a patronymic appellation of the family—the descendants of KADAPHES.

Of the gold coins of KADPHISES, two varieties only were hitherto known to us. By singular good fortune, Colonel SMITH has met with a third, and with duplicates of the former two, in the common bazar of Benares! His agent purchased the three, which are engraved at the top of Plate XXXVIII. from a shroff, who said they were sold to him two years ago by a Marhatta pilgrim to the holy city, in whose family they must doubtless have been hoarded for many centuries, for their character precludes any suspicion of their genuineness. Of fig. 2, I have since found a duplicate in KERÁMAT ALI's last despatch to myself: fig. 3, is a duplicate of the one Dr. MARTIN† extracted from the

* They must have been nearly contemporaneous. Lieut. CUNNINGHAM tells me, he has just obtained 163 KANERKI and KADPHISES copper coins, which were dug up in a village near Benares. The proportions of each type were as follows: KADPHISES and bull, 12; KANERKI, 60; elephant-rider, 48; running or dancing figure on reverse, 13; couch-lounger, 13; cross-legged, 5; squatted figure, 8; and undistinguishable, 4. In the collections from the Panjáb, the ill-executed descendants of the bull reverse predominate.

† The May No. of the Asiatic Journal of London contains an announcement of the safe arrival of this coin and of the collector himself, in Italy. Col. TOD on his travels happily found, and translated the following notice from the *Bulletin* of the Archæological Society of Rome, which our readers will read with avidity, although in fact it adds nothing new to our information.

"Signor HONIGBERGER has returned from a voyage in the east, laden with an abundant antiquarian harvest of most important medals. Among the more remarkable are a large one of DEMETRIUS; another, very beautiful, and in fine preservation, of EUTHYDEMUS; and a third, extremely perfect, of HORMUSDAS of the Sassanian dynasty: all three, it would appear, hitherto unknown (inédites). But what seems to us to merit still more consideration, is a similar monument, with the name of a king KADFISE written in Greek characters. Signor HONIGBERGER discovered it in the vicinity of Kábul; where, in a small wooden case, amongst a quantity of ashes and earth, he found a little silver box containing the above-mentioned coin, together with a blackish (or dark-coloured) Nerastra (stone in the form of an egg), with some small bones, apparently those of a child. Upon the medal is the bust of an aged man, of no very noble expression, bald-headed, in a simple garb, and holding in his right hand an implement resembling a hammer. Around it is a very distinct inscription, in Greek characters, ΚΑΔΦΙΣΕC ΒΑΣΙΛΕΤC; and less-well-preserved, other cha-

Jelálábád tope, depicted in MASSON's Plate XIII. vol. iii. Fig. 1, is as yet unique, and is of particular interest, from the style of the obverse. The king is here seen mounted on a Grecian or Roman war-chariot, drawn by two horses, and driven by an *auriga* of diminutive proportions. The execution is very perfect, with the exception of the exaggeration of the principal figure. The inscription is quite perfect, BACIAEYC OOHMO KAΔΦICHC, and on the reverse, in Pehlevi 𐭥𐭩𐭠𐭭𐭮𐭥𐭲𐭮𐭥𐭲𐭮𐭥𐭲

pronged symbol between them, and a mysterious triangle above. This little coin is unique. The next, fig. 9, is equally curious, though others in copper have been met with by Colonel STACY. The epigraphe borne by these is APAOXPO, which I suppose to mean "the great sun;" *arda* or *arta* in *Ardeshir* and *Artaxerxes*, having that acceptation. On the copper coins, the word appears corrupted to OPO OKPO, and this is probably the epigraphe of the dancing figure in Plate L.

In fig. 10, the name of the moon, MAO, and the lunar crescent, are satisfactory and conclusive, as to that being the correct reading.

And now we come at last to the main object to which this essay was directed, namely, to discover the prototype of the Kanouj coins in those of Indo-Scythic fabric.

The great majority of what are called the Kanouj gold coins have on the obverse a prince standing precisely in the attitude of KADPHISES and KANERKOS. The dress alone betrays a slight variation, being in some instances almost the coat and trowsers of the present day. On the reverse is a female seated sometimes on a couch, more frequently in the native fashion, holding in her left hand a cornucopia, in her right a *pása* or noose. This class of coin has long been known. A brass-pot, containing, it is said, two hundred of them, was accidentally discovered by the wearing away of the east bank of the river Huglí, 10 miles above Calcutta, some years ago. Twenty-four were presented to the British museum, an equal number to Dr. W. HUNTER, and a portion to the India House; the remainder were dispersed among private collectors. It was from one of these that Mr. WILSON's No. 13 was drawn; and the same store furnished the figures in MARSDEN's plate. The latter author in his *Numismata Orientalia*, vol. ii. page 725, has the following passage, which will serve excellently well as a text to the present section of our essay:

"Some learned antiquaries think they discover in these the evidences of a Greek origin; but on this point I do not see enough to justify an opinion, and shall refrain from conjecture; cherishing the hope that future discoveries of Indian medals may throw a light upon the subject, which is in itself of the highest interest."

To this challenge we have now the good fortune to be able to respond most satisfactorily, for in figs. 11 and 12 (of the VENTURA collection), we find precisely the obverse and reverse above described with the marginal legend in Greek, *rao nano rao.. korano*, and the superaddition of some incipient rude Nágarí in the position afterwards occupied by legible Sanscrit names and titles. To set the comparison in the clearest light, the two lowest coins in the page have been inserted, fig. 16 from Gen. VENTURA's, fig. 17 from Col. SMITH's, cabinet,

to shew the identity of the two classes. The description of them in detail belongs to the next plate, where instead of deteriorating, they will be found to improve, while they become indianized. An opposite effect is, however, observable in a second branch, derived from the same stock, which it is difficult to account for, unless by supposing a divided realm, one portion flourishing and patronising the arts, while the other maintained naught but the shadow of its pristine glory and ancestry. This declining gradation is exemplified in figs. 14 (VENTURA); 13 (STACY); and 15 (KERÁMAT-ALÍ); wherein at last it is barely possible to trace the semblance of the sacrificing rája on the obverse, or of the female on the reverse; although from the insensible gradations in a multitude of specimens, such are undoubtedly the figures. Fig. 15, is a very common coin in silver and copper: one was extracted from the *Mánikyála* tope, and was then supposed to bear the representation of a crab and a dagger! That coin, it will be remembered, bore the obvious Nágarí letters श्रीयग. Many others have been since discovered with the same; and it should be remarked, that the form of Nágarí in these differs essentially from that of the collateral branch.

Here then we have the Indo-Scythic paternity of the Kanouj coinage proved by the best evidence: and now we will proceed to examine in detail its Hindu offspring, before entering upon the natural enquiry whether such a fact is borne out by the meagre remnants of history and tradition that are applicable to this obscure period.

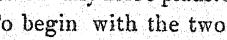
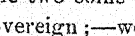
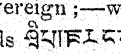
Plate XXXIX. Hindu Coins—First Kanouj Series.

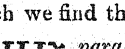
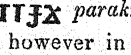
The Deva Nágarí alphabet, published with Mr. WATHEN's translation of the Guzerát copper-plates two months ago, will be found to apply in every respect to the coins before us: it is also nearly identical with the Gayá and Allahabad alphabets; the principal exceptions having place in the *m*, which in the latter is written more like ५, while in the former it is ४; and the *s*, which is respectively स in the latter, and ल in the former. To avoid the necessity of casting a new fount of type to illustrate the following observations, I have availed myself of the pervading similarity of the Tibetan alphabet; which, though several centuries later, can, with the alteration of a few letters, be employed for our purpose much more readily than the modern Deva Nágarí.

The Tibetan *r*, ར, answers for *t* of this alphabet: ད for *d*, and the prosodial stroke ཫ for *r*. The latter letter when inflected with the *a* or *i* vowel, may be represented exactly by the Nágarí short and long *i*, ि and ी. For the *k*, *g*, *dh*, and *m*, I have been obliged to cut new type ཀ, ဂ, ဎ, ४; and for the letter which I have supposed from some likeness to the Tibetan ཨ, to be *a*, I have given the new symbol ॸ

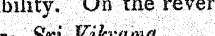
the same, it will be remarked, that was excluded from the consonants in the *lâth* alphabet No. 1. The remaining letters require no explanation, as a comparison of the type with the engraved figures will shew their slight difference of form.

The readings of the inscriptions in the present plates are for the most part new, and have been made out, dictionary in hand, by one unacquainted with Sanscrit :—they therefore claim indulgence, and will succumb to any more plausible interpretation from the professed scholar.

To begin with the two coins of the last plate, which appear to belong to the same sovereign ;—we find on the obverse (combining the two figures), the words  *Sri? (a) parajita davaja.* On the opposite side of a duplicate fig. 17, we find the name  *Kumára gupta,* and on the reverse, to the right,  *parakramah.* The whole title may be interpreted, (if in *davaja* we suppose an ignorant writing of the word *dhvaja,)* "The hero of the unconquered standard, the blessed KUMÁRA-GUPTA."

Beneath the left arm of the *Rája* also are three letters superposed in the Tibetan manner, *spyu ;* which we learn from M. CSOMA DE KÖRÖS to be pronounced *chu,* and to signify *Rája.* The same word is prefixed to every prince's name in the list of Assam Rájas. The triliteral compound may, however, denote a date. A duplicate of Colonel SMITH's coin, 17, was presented to me by Captain WADE. The WILLOUGHBY cabinet possesses another, and Mr. WILSON has given one precisely similar, in which we find the  *Kumára gu (pta)* of the obverse, and the  *parakrama* of the reverse very well marked—the first letter however in this, as in our coin, is more like *bhu* or *su* than *ku.*

In all of these specimens the trident of the *Rao* coins is changed into a standard, having a bird at the top, somewhat resembling the Roman eagle.

Figs. 18 and 19, are placed next in succession, because the cornucopia lady still sits on a couch in the European fashion. The *Rája* here holds a bow in the left hand, and in the right, a short stick ; for the fire altar below it is now removed. A bracelet on the shoulder, and the head dress, begin to look Indian. The letters on the margin of the obverse are lost, but in the bow, we find *chndr* superposed as before. MARSDEN[e] reads this combination *Chandra,* with some plausibility. On the reverse of 18, is the name or title of the prince  *Sri Vikrama.*

On fig. 19, the name is quite different *ápati rurha,* "The averter of misfortune."

The first and last letters of this name or title are doubtful, and on my first examination of the coin whence the drawing was made, I thought the first two letters might form the *bh* of WATHEN's *Gujeráti* alphabet, making the word *bhúpati rurha*, 'the overthrower of kings.' I have named the last letter from its resemblance to the ढ of the Nágarí alphabet. These two coins were dug up at Juanpur by Mr. TREGEAR, whose description will be found in vol. iii. p. 617.

Figs. 20 and 22, are of the kind described by MARSDEN. The goddess of plenty here sits in the native fashion on an ornamental stool, or a lotus flower. The cornucopia also is transformed into a large flower at the end of a stalk. The *Rája* still holds the bow, but he has a sash in fig. 20. The letters on the area are new, but hardly legible; and only on the reverse of fig. 22, can we attempt to decypher 𑀓𑀫 a portion perhaps of the former name, *Vikrama*. Fig. 20, was given to me by a lady; fig. 22, by Mr. CRACROFT.

Fig. 21, is a thin one-sided coin found by Lieut. CONOLLY, in the ruins of Kanouj; the letter beneath the left arm is here 𑀓 or *kra*: its meaning doubtful.

The next two coins were assorted together in the plate, because they had both two figures on the obverse; they are, however, essentially of different periods; and, if our former reasoning be correct, fig. 23, (of Lieut. CONOLLY's collection,) should be classed before the last two, or even earlier than any of the set; for it is difficult to form any Sanscrit name out of the characters on either side. Lieutenant CUNNINGHAM has kindly favored me with an impression of a similar coin in his possession, by which the legend of the obverse appears to be composed of the letters 𑀓𑀭𑀕𑀺𑀧𑁆𑀢 *kragípta paragu (pta)*.

In the obverse of the coin before us the same letters may be traced; but after the 𑀧𑁆 follows a 𑀭 making the word *kragipta paraguja*, a strange and unintelligible compound. On the reverse, the first three or four letters agree with the above; but the final is rather a 𑀥 *pha*, and the one preceding it is closed at the top, making it 𑀯 *va*. These may be faults of execution in a foreign artist, but they place the interpretation beyond conjecture.

Fig. 24, presented to me by Mr. G. BACON, as discovered (or rather purchased) at Kanouj, has already found a place in Prof. WILSON's plates. The dress of the male and female on the obverse is completely Hindu, as is the attitude of the reverse. The legend was given in facsimile in the *Researches* thus: 𑀰𑀸𑀦𑁆𑀤𑁆𑀭𑀕𑀼𑀧𑁆𑀢𑀲 and may be read, with allowance for imperfections, 𑀰𑀻𑀘𑁆𑀦𑀕𑀼𑀧𑁆𑀢 *Sri Chandra gupta*.

Fig. 25. We now come to an old acquaintance, the happy discovery

Hindu Coins. Canouj Series.

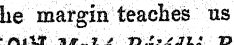
J. Prinsep sc.

Stanford University Libraries

of Lieut. CONOLLY, which has acted as a key to all the rest. An account of it is inserted in vol. iii. p. 227, where, however, on Dr. MILL's authority, the name was read as *Srí mad Ghavo Kacho*, from a misapprehension of the letter *m*. The reading commences on the obverse with the full title *Mahárája Adhi Rája Srí* (the name is cut off), and on the reverse *Srí* SACHHA VIKRAMA. The second word is doubtful, and without sense: perhaps it may be *Srí Pradyu*, 'the heavenly,' or simply *Srí mad Vikrama*.

Fig. 26, is another most important acquisition, for which we are beholden to Colonel STACY. An imperfect drawing of a similar coin appeared in WILSON's plates, which only misled as to the device, as well as the legend: both are here equally distinct. The Rája sits on a chair playing on a kind of harp, whence we learn his accomplishments; while the margin teaches us his titles and part of his name *Mahá Rájádhi Rája Srí... dra gupta*. The first letter of the name is the only one at all doubtful, and it is possible that the name may be simply a repetition of the one more unequivocally legible on the reverse, viz. SAMUDRA GUPTA.

I insert here the facsimile inscription of the duplicate coin of the Researches, of which I have luckily preserved the lead-cut:



Its identity with the above is manifest, *Mahárájádhi rája Srí Samudra-gupta*.

Fig. 27, is a sorry duplicate of the CONOLLY coin, belonging to Colonel STACY, with a variation of the epigraphe *Vikrama Narinamagupta*. I incline to think that the ས is intended for ར, and that the word should be *Narendra-gupta*, or it may be intended for *Naráyana-gupta*. The name on the reverse corresponds with fig. 25, *Sri pradyu Vikrama*.

Fig. 28, is from a sketch of a coin in Lieut. A. CUNNINGHAM's cabinet at Benares. He has since sent me faithful wax impressions, which expose slight inaccuracies in my outline. From neither, however, can the inscription encircling the hero triumphant over the lion be satisfactorily deduced; it may possibly be *Srí bal parakrama*; the letter on the field is, in the facsimile, *ku*.

On the reverse we are more lucky; for the legend, which I take to be the prince's name, *Kumára-gupta*, "the protected of Mars,"

* In using the Tibetan character, sometimes, we are forced to omit the long *a* vowel mark, which is merely a prolongation of the *matra*, or horizontal head-stroke in the coin writing.

is illustrated by an effigy of the wife of KÁRTIKA, or KUMÁRI' feeding his favorite bird the peacock. The same reverse is repeated in the two following varieties, where, however, the female is seated on a wicker *morha*, or stool, as in fig. 26.

Fig. 29, a coin of Lieut. BURT's, and its fellow, (presented to me by Miss WATSON,) introduce us to a perfectly novel device. The Rája is here mounted on a horse dressed in native trappings. It would be a loss of time to guess the superscription of 29. The same letters occur on both sides of fig. 30, and are plainer: they appear to be *Ajita Man'atri gu*.....

Two coins of the same style are depicted as figs. 17 and 18, of WILSON, who states that the natives designate them the coins of HIRANYA KASIPU. I presented to the Asiatic Society in 1830 a bronze image of a horseman dug up in *Bandelkhand*, which bears as close an affinity to this class of coin as the *Ventura chaprás* of Plate L. does to the elephant coin.

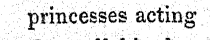
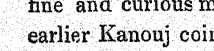
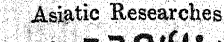
Of the next two coins, No. 31 had been added to my cabinet by Miss WATSON, and had excited not a little curiosity, before Colonel STACY's cabinet fell under my inspection; my attention was immediately attracted to his more perfect duplicate, (fig. 32,) which at once confirmed the reading I had as yet feared to pronounce, although the image of a richly bedecked horse, unfettered by bridle or rider, had led me to imagine some allusion to the celebrated horse-sacrifice undertaken by one or two of the most powerful of the ancient sovereigns of India. The deficient letters of one reading happen to be every where supplied by the other, so that there can be no doubt about the whole  *Asvamedha Parákrama*, "the hero or paramount hero of the Asvamedha." The female holding a chowry, to fan the flies from the devoted horse, is I presume one of the princesses acting as his attendant. Under the horse on both coins is the syllabic letter *Si*. History must be searched, if indeed any history can be found, ere we can determine who may lay claim to this fine and curious medal, which for the present closes our series of the earlier Kanouj coinage.

Fig. 33, of which Dr. SWINEY has numerous specimens, is inserted in this plate because of the style of its alphabet. The inscription is read by Dr. SWINEY,  *Mahárája Ganapati*.

It will be right to mention here, that one more of the *Gupta* family appears on a coin in the WILLOUGHBY collection depicted in the Asiatic Researches Plate I. I have seen the coin itself, and the facsimile  is correct, though the two first letters are of doubt-

ful nature. Mr. WILSON read the whole *Nara-gupta:* Dr. MILL, *Sasi-gupta.* I have nothing new to offer on the subject*.

Having now ocular demonstration of the intimate relation of the Indo-Scythic with the 2nd class of Hindu coins, the question naturally suggests itself, whether history is altogether silent on a point of such curious interest?

In first contradiction of such an inference, we find that the Indo-Scythic origin of the Rahtore dynasty of Kanouj has been advanced on very plausible grounds by the highest authority on this subject, Col. TOD, the annalist of Rájputánaf. He obtained from a *Jati,* (*Yati*) or Jain priest of a temple at *Nadolaye,* an ancient town in *Márwár,* a genealogical roll of the Rahtores, about 50 feet in length. "After detailing the usual theogony, it describes the production of the first Rahtore 'from the spine *(raht)* of Indra,' the nominal father being 'YAVANASWA, prince of *Parlipur.*' Of the topography of *Parlipur,* the Rahtores have no other notion than that it was in the north: but in the declared race of their progenitor, a *Yavan* or Greek prince of the *Aswa* or *Asi* tribe, one of the four which overturned the Greek kingdom of Bactria, we have a proof of the Scythic origin of this Rajpút family."

May it not be possible that the *Yavana* prince here alluded to may be the Azos (in Pehleví *Azo*) of the series of Bactrian coins published in my last notice? The Sanscrit word *Aswa* would be pronounced *Aso,* and be thus written in Persian or Pehleví (as *deo* for *deva,* &c.) The number and variety of his coins would imply that the name or title was that of a considerable dynasty, and some of the devices, for example, Nos. 10, 11, Plate XXII. of the goddess holding a cornucopia, may have naturally been the prototype of the Kanouj coins.

A considerable interval (from 300? to 470 A. D.) provokingly occurs between the name of YAVANASVA and the next prince, in Col. TOD's list—whether also omitted in the Jain original, or filled up only by barbarous and uninteresting names, we are not informed. The blank is relieved at length by the name of a genuine Hindu, NAYANA-PÁLA; but it happens that the missing part is the very one that could alone throw light upon our numismatic discoveries. Several coins (including the whole series of Kadphises and Kanerkis, intervene after

* Since finishing my plate, I have received a drawing of a small silver coin from Mr. TREGEAR, found at Jaunpur, having a head on one side, and on the other a bird, with outspread wings, under which in clearly defined characters is *Chandra-gupta.*

† TOD's Annals of Rájasthan, vol. ii. p. 5.

Azos, before we are brought to the absolute link coins of the Indo-Scythic and Hindu dynasties.

The name of *Náyana-pála* bears so near a resemblance to *Naráyana-gupta*, that a strong temptation arises to regenerate Colonel Tod's prince in him, on the same grounds on which his predecessor has been brought to life in Azos.

Indeed it would hardly be exceeding the bounds of legitimate conjecture, (where all is mere conjecture,) to adopt a historical representative of our Kanerki himself in the Kenek-sen of Colonel Tod, *Sén* being according to him merely a martial affix, equivalent to General or *Sénapati*.

Kenek-Sen, the founder of the Balhára dynasty according to the concurrent testimony of all the chronicles consulted by Tod, emigrated to *Saurashtra* about the year 144 A. D*. "from the most northern province of India, *Lohcote* or *Lahore*." In date and locality this origin would agree well with Kanerki: nor would it even set aside the former supposition of the same prince being the Tartar Kaniska of the Cashmír history; since that prince is made the sixth in succession after Asoka, the great patron of the Buddhists, who is placed by their chronology in 250 B. C., but who, when the correction for *Chandra-gupta* is applied, will fall full 50 years later.

In reasoning upon the probable seat of these obscure dynasties, it is by no means necessary to confine ourselves to one spot. The annals of *Mewár, Delhi, Málwá, Saurashtra*, shew a continual intermixture, as different princes acquired the ascendancy.

Kanouj has been fixed upon as the locale of the present class of gold coins, for the obvious reason that they are most frequently found in its ruins, not that any history ascribes them to this town; for the history of Kanouj is a perfect blank anterior to the fifth, we may even say the tenth century: and if the town had been suddenly involved in destruction, it is only certain that the coins found afterwards in its ruins would be those of the particular epoch, whether coined there or elsewhere.

There are arguments in favor of placing the seat of government further to the west, for instance at *Ujjain* (*Ujjayini*.) In the first place, the perfect identity of the coin-alphabet with that of the *Guzerát* inscriptions lately decyphered by Mr. Wathen†:—then, the prevalent worship of the sun in *Saurashtra*, and at *Ujjain*, where this object still forms the distinguishing symbol on the coinage‡, agrees

* Tod's *Rájasthan*, I. 215.

† See preceding page 480.

‡ The greater banner of Mewár also exhibits a golden sun on a crimson field, Tod I. 137.

well with the effigy of OKPO and APΔOKPO on the Indo-Scythic coins*. Again, the peacock of many of the *Kanouj* reverses is found on one of the principal series of *Saurâshtra* coins, as will hereafter be shewn; and Colonel TOD states that this sacred bird of the Hindu Mars (KUMÁRA) was the favorite armorial emblem of the Rájpút warrior. Lastly, many of the names on these coins may be traced in the catalogues of the *Málwá* and *Guzerát* princes; *Vikrama, Chandra, Samudra, Kumára, Ajita,* &c. the last four are coupled it is true with the family affix *pâla* instead of *gupta*; but both of these have the same signification.

In the *Rájávali* of Rája RAGHUNÁTH, quoted by WILFORD as the chief authority in Central and Western India, we find a sovereign named VIKRAMA reigning in the year 191 A. D. and succeeded, or rather supplanted 90 years later, by a SAMUDRA-PÁLA. The deeds attributed to these two are supposed to be merely an interpolation of the fabulous history of VIKRAMÁDITYA and SÁLIVÁHANA†: but the occurrence of these two names is very curious, allied to the circumstance and appearance of the two coins, figs. 25 and 26, of Plate XXXIX.

The only other instance of the occurrence of the name SAMUDRA-GUPTA, that I am aware of, is on the Allahabad pillar, where he appears as the son of a CHANDRA-GUPTA; and from the close similarity of the alphabets of the coins and of the láths, no reasonable doubt can be entertained that they relate to the same individual—a fact predicted by Dr. MILL in his valuable observations on this new race of kings (vol. iii. p. 267), to which the reader is referred for all the light that collateral history affords on the subject.

The name of VIKRAMA is referred by MARSDEN to *Bikram-tschand (Vikrama-chandra)* of the fourth century, in ANQUETIL's list of the kings of Central India‡. KUMÁRA-PÁLA is also one of the many names of SÁLIVÁHANA.

There is no reason however why *Kanouj* should not at some periods have been united under one sovereignty with the western provinces. The great VIKRAMÁDITYA (whose appellation in full is found on one of MARSDEN's coins) conquered *Indrapreshtha*, and extended his sway over the whole of India.

The Rahtore sovereigns of *Kanouj*, after its conquest by NAYANA-PÁLA, Col. TOD says, assumed the title of *Kam dhuj (Káma dhvaja)*.

* *Bhatarka* (sun-cherished) is a title of the earliest Balabhi Rája's in Mr. WATHEN's inscriptions, p. 480.

† As. Res. IX. 135.

‡ Num. Orient. II. 727.

If this alluded to their armorial insignia, we may thus find an explanation of the standard on the earlier coins;—and it may be equally applied to the *Aparajita dhvaja* of fig. 16.

Another curious circumstance is mentioned in Col. Tod's chronicles of *Márwár*, that may help us a step forward in the investigation of this obscure history. It is there said, "Dharma-Bhumbo had a son, Ajaya Chandra. For twenty-one generations they bore the titles of *Rao*, afterwards that of *Rája*." We are again left in the dark as to who first assumed the title of *Rája*; but as we find the title *Rao* in Greek visible on the very latest coin that bears an inscription in that character; while on the fine gold coin discovered by Lieut. Conolly, of Vikrama, fig. 25, we have the title *Mahárája Adhirája Srí*, quite distinct; it must have been between the two that the change of title was assumed. But I should be inclined to interpret the above passage in the *Yati's* roll, as meaning that up to Aji Chandra, or *for the* 21 *generations preceding him*, the title *Rao* had been used, and henceforward that of *Rája* was adopted: for why should the historian allude to the circumstance until the change of title actually took place? Moreover, there are only 16 generations mentioned from Aji Chandra down to the last of the Kanouj sovereigns, the celebrated Jaya Chandra or Jey-Chand, anterior to whom the title was certainly borne, for we find it on the coins of Vikrama, Samudra-gupta, and others, names not included in the list, but which we know from the style of the Deva Nágari character must have belonged to a much earlier epoch than the seventh or eighth century, in which Bhumbo is placed.

The Rev. Dr. Mill has led us to put little faith in the authority of the bards and panegyrists of the native courts; and it must be confessed, that the contrast of Colonel Tod's genealogy with the incontestible testimony of the Sanscrit inscriptions read by Colebrooke, Fell, and Wilson, is enough to perplex the most ingenious amalgamist! We must then maintain a thorough independence of all such traditionary documents, and adhere in preference to the faithful evidence of monuments and coins. In the present case, I have shewn how these confirm one another in a remarkable and unexpected manner, in regard to the names on the Allahabad pillar, inscription No. 2, all of which re-appear on these early Kanouj coins. In a subsequent paper I shall produce equally convincing evidence that those of the Benares and Delhi inscriptions are reproduced upon a second series of Kanouj coins of a much more modern character.

All then that can be now attempted is, to recapitulate the names

that have been brought to light in the present investigation, names for which we are indebted to the joint contributions of not less than a dozen friends*, leaving the proper arrangement of them to a more advanced stage of our knowledge than we at present possess.

The following are the names and titles that appear on the coins of the two last plates.

1. *Sri Aparájita dhvaja Kumáragupta parákrama.*
2. *Sri Vikrama Chandra.*
3. *A'patti rurhah,* or *Bhupati rurha.*
4. *Kragipta paragu (pta.)*
5. *Chandragupta.*
6. *Máharája adhi rája Sri .... Sri pradyu Vikrama.*
7. *Sri Vikrama Narendra gupta.*
8. *Mahárája adhi rája Sri Samudragupta.*
9. *..Srí bal vikrama Kumáragupta.....*
10. *Ajita mañatrigupta*
11. *Asvamedha parákrama.*

To these may be added the

12. *Vikramáditya* of MARSDEN's collection, and the
13. *Sasi-gupta,* of Prof. WILSON's plates.

[To be continued.]

IV.—*Application of Iron Rods, proposed to compensate for the strain occasioned by the tension of the strings upon Piano Fortes, thereby to prevent warping, and to render them more durable and better adapted to keep longer in tune. By Col.* D. PRESGRAVE.

By a notice in your Journal, No. 17, May 1833, of some improvements that had been made in square piano-fortes, I am induced to send an account of a scheme, which I devised and put in practice in January, 1833. The object of which is to strengthen the instrument, so as to prevent warping or twisting, thereby rendering it more lasting and less liable to get out of tune.

It is stated in the above-quoted article, that it is by the slipping of the round iron pegs in their wooden sockets, that a piano gets out of tune; but I am inclined to think, that this is not to be attributed so much to that circumstance, as to other causes, such as change in the level of the instrument by the unceasing strain or tension upon it; the effect of temperature on the wires, and of the atmosphere on the porous material (wood) of which the instrument is constructed. Whilst pianos are very new, they require comparatively little tuning;

* VENTURA, KERA'MAT ALI, WADE, TREGEAR, CUNNINGHAM, BURT, STACY, WATSON, SMITH, SWINEY, CRACROFT, and CONOLLY.

but as they increase in age, so do they, in consequence of progressive warping, require it the oftener.

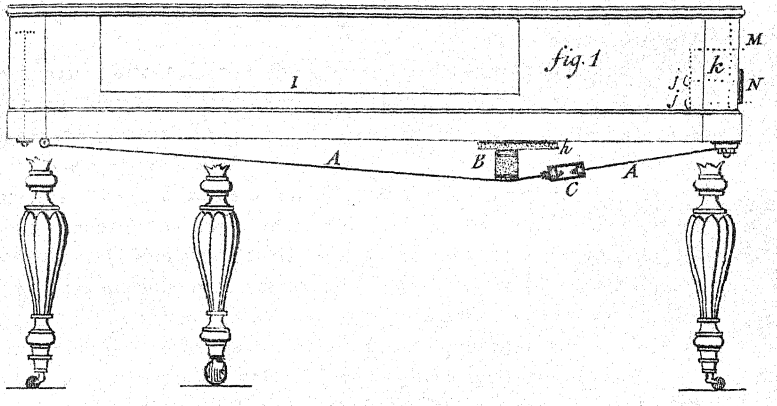
The constant tension of the strings effects such a strain upon the piano, that the opposite corners (in the direction of the wires) of almost every one, however new, will be found, if accurately examined, to be turned up more or less. Thus it will be easy to conceive, that so long as the *bed* retains inflexibly its straight or level form, the piano will last, possessing the property of remaining *longer* in tune, and of being more easily tuned: but let the strings once gain an ascendancy over the horizontal level of the bed, and the turning up thereof will proceed with accelerated speed.

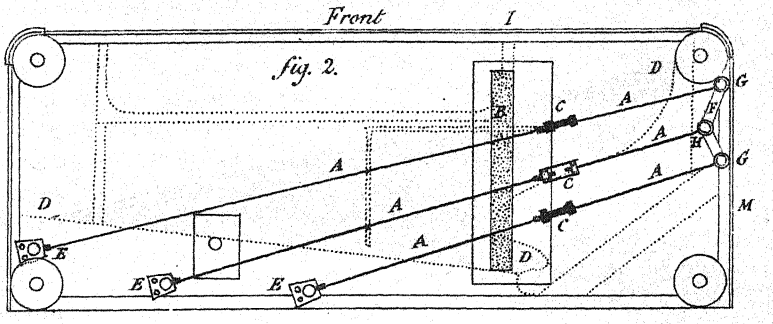
In Calcutta, where people enjoy the means, and have the opportunity, they do not keep their pianos beyond a year, but pay for an annual exchange; thus getting rid of them before the warping gives annoyance, and is not so great as to render them unsaleable; but it is not so with people situated away from the metropolis, who are compelled to take whatever pianos are sent them, which they are doomed to use for years, until they may be seen with two inches and even more, turn up: in this state many are quite unconscious of the defects of their pianos, and attribute their not remaining in tune to climate, to want of skill in the tuner, or to any other cause, rather than to the deplorable state of the instrument.

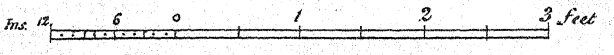
To prevent this warping, several plans (and patents I believe) have been adopted by makers. Some of them consist in the application, in various ways, of plates and bars inserted at the back, and in the inside of the piano. One of the plans adopted is, that of a square iron bar, about three and a half feet in length, and upwards of 15 lbs. in weight, screwed (in the direction of the wires) to the underside of the piano, with five *wood-screws*, scarcely weighing three drachms each, and a slight bolt, to connect the end of the bar, by means of a nut and screw to the end of the piano; indeed, if this bar were even more substantially fixed to the instrument, it does not appear to me calculated to be of any material service in strengthening it.

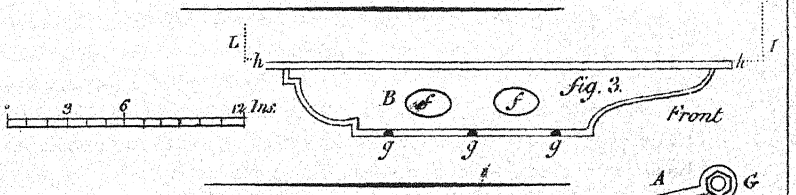
In January, 1833, I took to pieces an old piano belonging to a friend, with the intention of trying to straighten it. During this operation, whilst reflecting on the immense pull that the wires constantly exert beyond all power of the bed, as at present constructed, of any piano to resist; it occurred to me, that if a counter strain to the wires *above* could be contrived and attached to the opposite or *underside* of the bed, the desired object of keeping the piano straight, thereby rendering it far more durable, and disposed to keep longer in tune, would be accomplished.

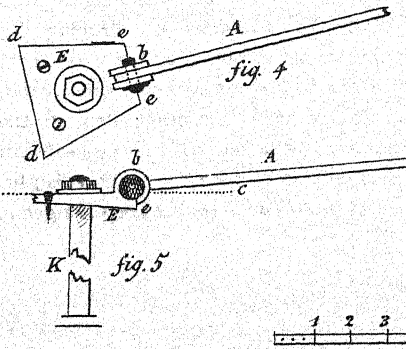
Presgrave's Compensation Rods for Piano Fortes

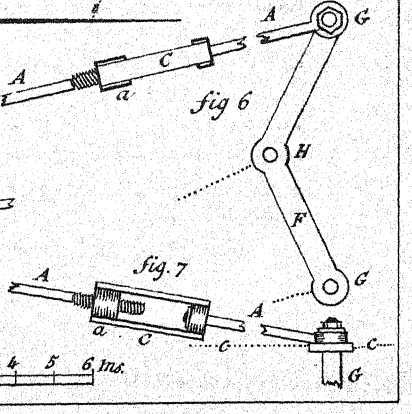












J.B. Tassin's Lith. Press.

Ex Bibliotheca

The compensation for the strain of the wires *above* is effected by placing iron rods (two or three) in a direction parallel with the strings, but *below* the bed of the instrument. The rods are fixed at their extremities by a joint, to iron clamps, which are screwed to the underside of the bed, and bolted at one end of the piano, through the bed and block that holds the tuning pegs, and at the other, through the bed, block, and plank. The extremities of the rods being thus *fixed*, their power is obtained by drawing them over a stout wooden bridge, placed at about two feet from the end, just below the keys of the highest notes, and then drawn by adjusting frame, nuts, and screws, as tight as is necessary; as will, I hope, be distinctly shewn by the accompanying plate and description.

Fig. 1, is an elevation of a piano, which shews one of the rods, A, as applied below, drawn by the adjusting screw C tight over the bridge B. (The same letters apply to all the figures.) The bridge B is shewn on a larger scale at fig. 3. By the drawing, fig. 1, the end of the bridge B seems to present an unsightly appearance, but it is not so in reality; the rods crossing the bridge, at some distance from the front, as at I in figs. 2 and 3; and so little are they visible, that they would not be observed, unless attention was drawn towards them.

The frame or adjusting nut C turns at one end on a knob or head, formed on the end of the (short) rod, having a flat brass ring interposed (to reduce the friction) between its head and the inside bearing of the frame: the other end of the frame is made *thick*, as at figures 6 and 7, having a screw formed within it, to receive that on the end of the rod. The screws are raised *above* the surface, and not cut into the thickness of the rods.

Fig. 2, represents the piano, turned upside down. A A A are the rods, running in the same direction with the strings of the piano, intended to be expressed by the shaded part between D D D.

E E E, clamps with joints *b*, figs. 4 and 5, to receive the ends of the rods, in which they are held by a small bolt. The clamps are sunk in the wood, as shewn by the dotted line *c c*, are *broader* towards their outer ends, *d d*, and *thicker* towards *e e*, that they may oppose more surface in the wood, against the tension or drag of the rods A.—F. figs. 2 and 6, is a clamp of another description, (it was applied to one of the pianos operated upon;) by it the bolts fixing the ends of the three rods are connected: the two outer bolts GG, passing through the end plank of the piano, and the centre one, H, through the bed, block, and metal plate, on which the wires are fixed; instead of thus connecting the ends of the rods by one clamp, separate clamps like EE, figs. 4 and 5 have been used: the clamps EEE, besides

being bolted *through* the piano, are each further secured by two wood screws.

The exact spots for fixing the clamp at both extremities of the rods, must be determined, according to circumstances, by the judgment of the individual applying them, because pianos vary in their internal construction; on which account also, it is obvious, that they would be applied, with the greatest advantage, by manufacturers in the first construction of the instruments, as the makers would have it in their power to accommodate the internal arrangement of the pianos to the most desirable position for fixing them.

The rods should be applied to new pianos, before warping takes place; they may be put to old instruments, though not with equal advantage, from the circumstance of the *blocks* of wood placed at the end, under the sounding board, together with the *iron bar*, which is screwed at one end on to the block, bearing the tuning pegs, fixed at the other to the metal plate, on which the strings are hooked, being thrust, by the warping of the instrument, out of their places; for when a piano has been straightened, they will be found to have parted from those original bearings, on which mainly depended the strength of the piano. However objectionable this loss of bearing may be, the power of the rods is nevertheless the more clearly indicated by their sustaining the piano in its straightened state against the tension of the strings.

Fig. 3, B, is the bridge; *f f* are holes cut obliquely through it, to lighten it; *g g g* are the places where the rods cross it; the bridge is $2\frac{1}{4}$ inches thick, and with the plank *h h* above it, in depth $3\frac{1}{2}$ or $3\frac{3}{4}$ inches; the dotted lines at I and L shew the body of the piano, across its breadth.

Fig 5, K, is the bolt that fixes the clamp E, by passing through the block, (bearing the tuning pegs,) the bed of the piano, and by a nut and screw fastening below the clamp. The whole of fig. 5, is represented upside down.

The rods are of round iron wire, $\frac{3}{16}$ of an inch in diameter. Hitherto, not less than three rods have been put to a piano; but perhaps two might be found sufficient. It is possible to draw the rods too tight, especially when first put on, and if the piano was much warped; for the instrument does not accommodate itself to the new tension for some time: it will therefore be necessary, until it settles, to examine it daily; for if the rods are not slackened by turning the adjusting screws, the strings might be endangered.

Many pianos may be seen with the end plank M. figs. 1 and 2, split; occasioned entirely by the pull of the strings. The bolts GG, figs. 2 and 6, secure the plank against this failure. The block

k, fig. 1, on which, in the absence of a metal plate, the strings are hooked, is also, by the tension of the wires, liable to separate from the end plank M. In two instances, where this had occurred, previous to applying the rods, bolts with their heads resting inside at *jj* were passed through the block *k*, plank M, and a broad substantial plate of polished brass N, on the outside of which they were evenly rivetted.

The foregoing plan for keeping piano-fortes straight was, I have been informed, mentioned to Messrs. BROADWOOD AND Co. in London; but from what they said, I am inclined to think, was in the absence of drawings, or written description, imperfectly explained to them. They observed, that "they found the iron bar, as offering a resistance to the pull of the strings of the piano-forte, would best effect the purpose." If the iron bar here alluded to is that which props between the block bearing the turning pegs and the metal plate on which the strings are hooked, it must be well known to those who are conversant with the mechanism of piano-fortes, that although it may be of some service, it is quite inadequate to prevent warping in India. A piano that had warped an inch and a quarter, but which had been fitted with one of those bars, was straightend by weight and other means, and secured with a set of three rods, when the iron bar, no longer reaching its original bearings, required to be lengthened before it could be again applied.

The rods have been successfully applied to five piano-fortes, and approved of by judges competent as well by their musical as by their mechanical skill. Although possessing powerful command over the instrument, they do not, as it may be supposed solid iron bars would, at all check, as far as the vibrations of sound are concerned, the elasticity of the pianos.

When a piano-forte warps, a corresponding twist is gradually communicated to all the keys, throwing them out of their places, and causing them to stick: it also detaches the hammers partially from their own strings, and makes them touch those of the neighbouring notes; thus occasioning an unpleasant discord.

Piano-fortes would probably, without detriment to their tone, be greatly preserved and defended against the effects of climate, particularly the damp atmosphere of the rainy season in India, by the application of good *oil* varnish, such as is used by coach-makers, not only to the under sides and backs of pianos, which are invariably found in the state left by the joiner's plane, but also to the beds, side, ends, and blocks within, wherever it can be spread, prior to the putting in of the sounding board, keys, dampers, &c. &c.

V.—*Notice of two beds of Coal discovered by Captain* J. R. OUSELEY, *P. A. to the Commissioner at Hoshangabád, near Bara Garahwára, in the Valley of the Narbada, 5th Jan.* 1835. *Pl. LIII.*

Hearing of black stones being found near *Mohpáni*, seven or eight miles from *Chicheli*, and 12 or 14 from *Garahwára* proper, on the *Sakar*, I went there, and found, as they described, black stones; but placing them on the fire, they did not burn. They are in strata of 10 feet to 15 feet thick, solid masses, perpendicular, (strata,) as if thrown up by some convulsion of nature, intermixed with strata of grey yellow and brown sandstone, mica-looking grit, (vide A, plan of coal bed,) and marl, on the left bank of the Síta Rewa, which flows along the bottom. I proceeded up the bed of this nalla for about two miles, when I came upon what appears to me to be a very fine bed of coal.

The river *Síta Rewa*, flowing from the south, here emerges from the hills at the N. E. angle of *Nimbuagarh*, a name given to one of the hills within half a mile of the coal bed. The current has uncovered for 100 yards the coal: its thickness is unknown as yet; that exposed, being about 14 feet thick. After so many attempts at discovering coal, which only proved to be mere seams of anthracite, I felt much gratified at discovering so large a bed. The road by which I proceeded up and along the river, I found very bad; but I returned by a most excellent one, being that used by the villagers for bringing wood from the jungles: the whole way being a plain, and practicable for any kind of carriage.

At the junction of the *Hard* and *Sakar* rivers, I also discovered a bed of coal, seemingly of as good quality: the seam about three feet thick; but on account of the magnitude of the other bed, this became an object of less inquiry. I ascertained also that limestone and iron ore were in abundance.

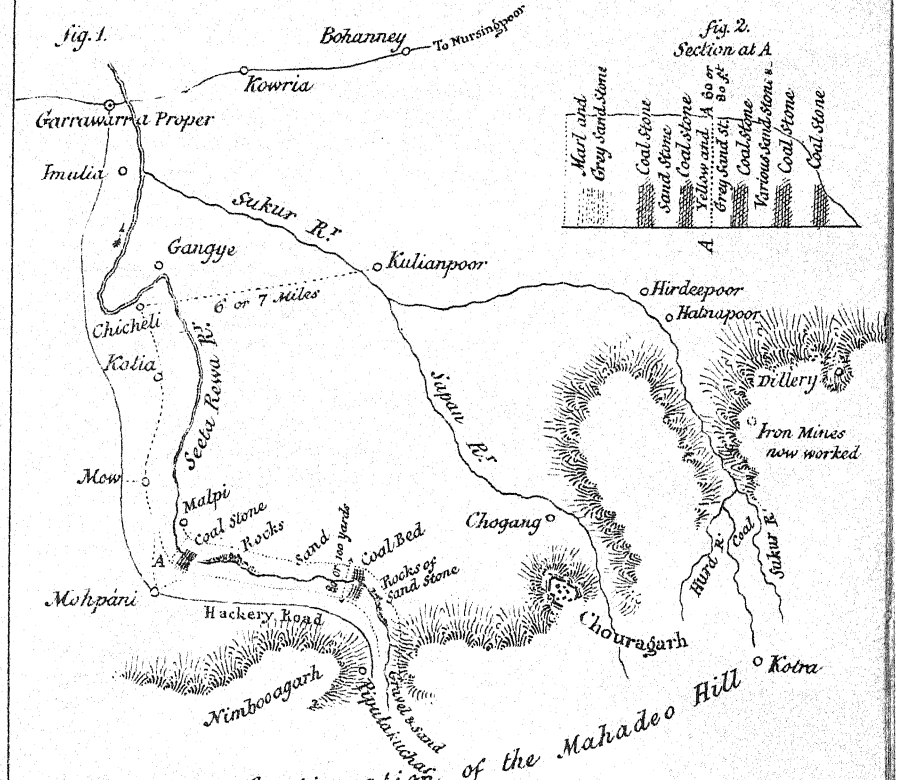
VI.—*Specific name and character of a new species of Cervus, discovered by* B. H. HODGSON, *Esq. in* 1825, *and indicated in his Catalogue by the local name of Bahraiya.*

In the catalogue of the Mammalia of Nipal, a new species of Cervus is designated by the local name of *Bahraiya*, and it is therein remarked, that the species forms, with *C. Wallichii*, a chain of connexion between the Elaphine and Rusan groups. The horns, which at once fix the specific character and its novelty, were sometime back given in the journal. But these notices having failed to fix attention, and the animal in question being still confounded with the *Saumer, Jerow*, or *Jarái*, it may be as well to define the species more precisely, and to give it a scientific name.

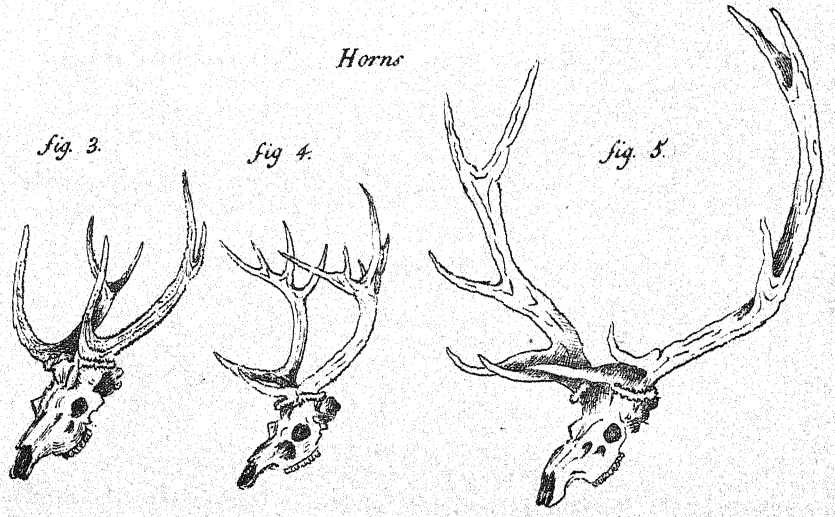
Genus—CERVUS. Sub-Genus *Elaphus*, (English Regne Anim.) Cervus *Elaphoïdes*. Stag-like deer, mihi.

C. El. brown-red deer, with moderate-sized, stout, pale horns, branched at the summits, as in Elaphus; but with no bezantler, and only one browantler to each beam. In stature and aspect, mediate between Hippelaphus and Elaphus. Icon penes nos. *Bahraiya* of the Cat. Nip. Mam., called *Máha* in the Western Ṭaraï.

Sketch of Nimbuagarh Coal Bed _ Nerbada Valley.



Horns



J.B. Tassin's Lith.c Press. Calcutta.

To Stanford

Remarks.—The horns of this animal differ from those of any known species. In size, curvature, and thickness, they agree with those of the Hippelaphus of Du Vaucel and of Cuvier: and are considerably less large than those of Elaphus. But in colour and rugosity, they depart from the former, to approach the latter, with which they have, besides, a strict correspondence in the numerous snags crowning their summits, and also in the *anteal* insertion and *forward* direction of the browantler. The absence of the median process, and the singleness of the basal one, are points of similitude with the Hippelaphine or Rusan group, in which, however, the basal or browantler has always an *oblique* insertion and *upward* direction.

Wallich's deer, again, has *two* browantlers directed forwards; but has only a *single superior* process from the beam; and it is almost deprived of tail, whilst that member is more developed in the Rusan than in the Elaphine group. The dark and shaggy coat of the Rusans is not traceable in *Wallichii*, which is even paler than the European red deer. In these respects, our animal more nearly than *Wallichii* approaches the European stag; but in the singleness of his browantler, he recedes further from the European type than does Wallichii. He serves, in all respects, to form a fresh and striking link of connexion between the Hippelaphine and Elaphine groups, which groups, H. Smith supposes to be respectively the Asiatic and European types of *Cervus*. The *first* discovered link in this connexion was Wallich's deer. *Elaphoïdes*, (mihi,) constitutes *another*, equally distinct and remarkable. In the synoptical arrangement of the English Regne animal, *Elaphoïdes* must have a place immediately after or before *C. Wallichii*; with which species our's will serve to smooth the transition from *Elaphus* to *Rusa*. The crowned summits of the horns, each of which bears four or five processes, inclusive of the point of the beam, at once distinguishes *Elaphoïdes* from the Jerows, Jaráis, or Saumers of the continent and islands of India. All the latter belong to the Rusan group, and in their manners are remarkable for exclusive adherence to the heaviest forest jungle, whence they frequently penetrate into the proximate mountains or hills. On the contrary, *Elaphoïdes* (the *Bahraiya* or *Mahá*) never was known to enter the mountains; nor does he, save casually, resort to the depths of the forests. His lair is on the *skirts* of large forests, amid the grassy and swampy glades which abound in such vicinities. Lastly, his female is of a whitey-brown or pale dun hue: whereas the females of the Rusans are dark-hued, as the males.

Explanation of Plate LIII.

Fig. 3. *Cervus Elaphus*, Nipalese *Sál* forest: vulgo, *Bára Sinha*, type of Cervus.

Fig. 4. *Cervus Elaphoïdes*, mihi: vulgo, *Bahraiya* and *Mahá*, Nipalese and Western Taraïs; osculant.

Fig. 5. *Cervus Hippelaphus*: type of *Rusa*.

Note.—All three heads on an uniform scale. The stag's horns shew the two basal processes, and the median on either beam; but the terminal crown of snags is not developed, owing to youth. Each horn has but one superior process from the beam, instead of three or four.

VII.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 2nd December, 1835.

The Rev. W. H. Mill, D. D. Vice-President, in the chair.

His Excellency Sir Henry Fane, Commander-in-Chief, and Mr. Charles Augustus Nott, proposed at the last meeting, were ballotted for, and duly elected members.

Read letters from Colonel W. H. Sykes, and Professor W. Buckland, acknowledging their election as honorary members.

Read letters from H. Harkness, Esq. Secretary to the Royal Asiatic Society, and Nicholas Carlisle, Esq. Secretary to the Society of Antiquaries, acknowledging the receipt of copies of Mr. Csoma's Tibetan Grammar and Dictionary.

Read a letter from Dr. Lautard, Secretary to the Royal Academy of Marseilles, proposing an interchange of publications, and inclosing a diploma of honorary membership for the Secretary of the Asiatic Society; also presenting two volumes of the "Histoire de l'Academie de Marseilles."

Resolved, that copies of the Researches be sent in return to Marseilles.

The recent change in the currency of the Bengal currency, having been brought under consideration by the Secretary, it was

Resolved, that from the 1st January, 1836, all quarterly subscriptions and fees of admission to the Society, be collected in the new rupee; viz. 32 Company's rupees for the admission fee; 16 Co.'s Rs. for the quarterly subscription of ordinary members; and 4 Co.'s Rs. for the yearly subscription of Associate Members.

Mr. Csoma de Körös, in a letter to the Secretary, intimated his intention of quitting Calcutta for the Western Provinces, and requested the loan of some Sanscrit books, which was granted.

Library.

Read a letter from M. Rouy de Rochelle, President of the Central Committee of the Geographical Society of Paris, forwarding a copy of Bulletin de la Société de Geographie, vols. 1st and 2nd.

The following books were presented on the part of Lieut.-Col. W. H. Sykes, the Author.

A Catalogue of the Mammalia and Birds, observed in Dukhun.
On the Atmospheric Tides and Meteorology of Dukhun.
Description of the Wild Dog of the Western Ghats.
Some account of the Kolisura Silk-worm of the Dukhun.
Proceedings of the Statistical Society of London, No. I. vol. 1st.

The following works by Sir J. F. W. Herschel.

A list of Test Objects, principally Double Stars.
Notices on the Orbits of revolving Double Stars.
Micrometrical measures of ditto.
On the Satellites of Uranus, and Observations of Biela's Comet.

Also:—

The Indian Journal of Medical Science, No. 24—*by the Editors.*

Two copies of Impression of the Orrery and Simple Illustrations of Eclipses, translated into Bengáli by Máhá Rájàh Kalikissen—*by the Author.*

Meteorological Register for October, 1835—*by the Surveyor General.*

DUMOULIN'S Gulistan, 1807, and Karab-ud-din, a Medical work, MS. were presented—*by Professor H. H. Wilson.*

The following books received from the booksellers:

LARDNER'S Cabinet Cyclopedia—Germanic Empire, vol. 3rd.

Ditto ditto—Greece, vol. 1st.

Literary and Antiquities.

Read a letter from W. H. WATHEN, Esq. forwarding a memoir on Chinese Tartary and Khoten.

[This will be published in our next.]

The Hon'ble Lieut.-Col. MORRISON, presented, on the part of the Author, a paper on the State of Arts of the Cotton Spinning, Printing, and Dyeing in Nepal, by Dr. A. CAMPBELL; with specimens.

Read a letter from Capt. T. J. TAYLOR, forwarding extract from a Journal of the late Major WARD, of the Madras European Regiment, regarding the inhabitants of the Varshagiri mountains in the Peninsula.

Read a letter from Lieut. H. ABBOTT, Mhow, forwarding an essay upon Comets, containing a new theory of the phenomena of the coma.

Read a letter from G. W. TRAILL, Esq. forwarding copy of an inscription in the nail-headed form of Sanscrit in Kemaon.

Read extracts of a letter from Dr. BENZA, on the subject of some ancient coins dug up in a 'cairn' on the *Nilgiris.*

From Lieut. A. CUNNINGHAM, at Benares, were received several very beautifully sculptured small Buddha images, discovered in the excavations at *Sárnáth;* also copies of various inscriptions, and impressions of coins.

Physical.

The Secretary announced the arrival of six chests of fossil bones from the *sub-Himálayas,* forming the first dispatch of Colonel J. COLVIN'S munificent donation promised on the 14th January, 1835. (see page 56.)

In this collection, which Colonel COLVIN'S letter describes as containing the fossils in their rough matrix, as they were brought down by the native workmen employed in their excavation, a cursory inspection shewed several very large and complete jaws of the elephant, mastodon, hippopotamus, crocodile, and of other animals not immediately recognized. Col. COLVIN'S letter of the 4th October, intimated the further dispatch of seven chests of fossils, more carefully selected and classified, of which a full catalogue has been furnished by the indefatigable collectors at Dádupur.

[We postpone our account of the whole until the second dispatch arrives.]

Specimens of a crustaceous animal taken from the Greenland Whale, presented by Mr. STEPHENSON, with an explanatory note.

A specimen of *Lophophorus Impeyanus,* by Mr. C. W. SMITH.

A collection of bones of various mammalia, by Mr. J. T. PEARSON.

Specimens of the soil and strata of the bed of the *Sámar* lake, and of the salt in its different stages of formation, were presented by Capt. A. CONOLLY, Assistant Resident *Jaipur.*

A note of their chemical analysis by Mr. STEPHENSON, and the Secretary, was at the same time submitted.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of November, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	29,918			79,5	12,3	3,3		,826	,716	1,110	82,2	9,1	8,4	84	70,2	129,		N.	ne.	NW.	clear.	clear.	fine.
2	,944	,866	1,078	80,8	8,4	7,6	87	,814			81,5	16,6			69,5	127,2		N.	N.	N.	do	do	clear.
3	,956	,887	,069	80,8	7,9	7,1	88	,865	,745	,120	82,5	8,5	7,7	87	72,2	123,2		NE.	N.	ne.	do	do	mist.
4	,993	,930	,063	81,6	6,3	5,3	94	,856	,806	,050	80,9	4,4	4,6	96	74,5	84,0		E.	se.	se.	overcast.	hazy.	dull.
5	,927	,946	0,981	79,1	3,6	3,6	99	,779	,830	0,949	78,6	4,2	3,5	99	71,5	80,0		ne.	ne.	ne.	set. rain.	rain.	do
6	,797	,770	1,027	79,3	3,1	3,1	99	,656	,596	1,060	80,8	3,9	3,4	98	71,5	101,3		ne.	ne.	ne.	overcast.	hazy	overcast.
7	,792	,845	0,957	77,6	3,1	3,1	100	,720	,798	0,932	76,8	2,8	2,8	100	68,2	75,2	0,40	N.	nne.	nne.	hard rain.	do	showery.
8	,914			73,4	4,2			,846			77,3	11,2			67,2	117,5	2,94	N.	N.	n.	cloudy.	do	cumuli.
9	,982	,047	,935	77,1	9,4	8,7	80	,898	,866	1,032	78,9	10,8	10,0	76	68,2	115,4		nw.	NW.	nw.	clear.	fine.	fine.
10	,985	,122	,863	75,3	8,0	7,0	87	,908	,944	0,964	78,0	8,9	10,0	76	63,2	122,4		nw.	NW.	nw.	do	fair.	do
11	,060	,197	,863	75,0	9,4	9,0	79	,960	,020	,940	77,3	16,0	14,5	62	61,5	118,0		nw.	NW.	nw.	do	do	do
12	,042	,194	,848	74,7	10,8	9,0	80	,967	,047	,920	76,7	9,7	8,5	82	59,5	114,0		NW.	nw.	nw.	do	do	do
13	,062	,195	,867	75,1	7,1	6,0	90	,956	,997	,959	77,5	9,5	8,5	87	62,1	89,0		n.	nw.	nw.	do	do	do
14	,124			71,8	6,5			,970			77,0	9,1			62,1	87,0		o.	N.	n.	do	clear.	do
15	,092			76,0	8,3			,975			77,8	12,0			60,4	89,1		NW.	o.	n.	do	do	cumuli.
16	,065	,170	,895	76,0	6,2	5,0	94	,962	,016	,946	77,6	10,8	9,0	82	62,5	90,2		N.	n.	n.	do	cumuli.	do
17	,067	,182	,885	75,7	5,0	4,6	97	,971	,020	,951	77,6	8,9	7,8	85	63,2	89,2		o.	nw.	nw.	cirri.	do	fine.
18	,058	,148	,910	76,1	6,1	5,6	92	,959	,984	,975	78,1	10,0	8,6	81	62,0	88,4		o.	nw.	n.	clear.	clear.	do
19	,086	,166	,920	76,4	7,4	6,4	89	,971	,997	,974	78,3	9,2	7,8	83	61,5	86,7		o.	nw.	N.	dew.	do	do
20	,078			73,6	7,8			,994			77,7	12,7			60,4	89,0		o.	o.	N.	fog.	do	cirri.
21	,066	,132	,884	75,8	7,6	7,0	88	,960	,998	,962	77,3	10,9	10,7	76	60,0	88,2		o.	N.	N.	do	do	clear.
22	,070			70,8	11,6			,980			73,0	13,7			60,5	83,8		n.	o.	n.	clear.	do	fine.
23	,077	,248	,839	73,8	9,9	9,0	81	,983	,097	,886	75,1	11,1	10,3	75	54,2	83,8		o.	N.	n.	do	do	clear.
24	,109	,288	,821	73,4	8,2	7,0	87	,016	,084	,932	76,5	11,2	10,0	80	54,2	89,2		o.	N.	nw.	do	do	do
25	,126	,247	,879	74,7	8,0	6,7	89	,038	,097	,941	76,7	10,5	10,0	79	57,2	90,3		n.	NW.	n.	do	do	do
26	,125	,266	,859	74,5	6,5	5,3	92	,009	,076	,933	76,4	9,8	9,0	80	58,7	87,8		o.	n.	n.	do	do	do
27	,099	,223	,876	74,6	7,4	6,2	89	,982	,040	,942	76,7	11,0	10,4	78	58,0	88,0		o.	n.	nw.	do	do	do
28	,030	,170	,860	74,6	10,8	9,4	81	,928	,038	,890	75,7	11,2	10,4	78	57,2	84,0		sw.	n.	nw.	do	do	do
29	,044			69,7	9,3			,952			74,2	13,4			56,6	85,5		n.	n.	nw.	do	do	do
30	,025	,198	,827	73,3	8,7	7,4	86	,949	,094	,845	74,3	9,3	9,0	81	54,8	88,8		nw.	n.	n.	do	do	do
Mean,	29,025	28,108	0,914	75,6	7,7	6,6	89	,925	,952	0,966	77,9	10,0	8,5	83	62,7	96,8	3,14	North.			One storm, then fine and cold.		

On the 14th instant the Register Thermometer was removed from the top of a house in Calcutta, to Chowringhee; where it was placed in a garden 2 feet from the ground, near a tank. On this account it did not range so high in the day. A new correction—.020 is also applied to the Barometer on Sundays, now placed on the second story.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 48.—*December,* 1835.

I.—*Memoir on Chinese Tartary and Khoten. By* W. H. WATHEN, *Esq., Persian Secretary to the Bombay Government.*

[*Extract of a letter to the Sec. As. Soc. read at the Meeting of the 2nd inst.*]

Having had opportunities of conversing with many natives of Chinese Tartary, several of whom were intelligent and well-informed men, I have drawn up a description of the country, from the information I obtained from them; and, as in the absence of any more correct accounts of a region which has not been visited since the time of GENGHIZ KHA'N and his successors, this may prove interesting, I transmit the memoir to you, to be laid before the Society.

I am well aware of the great caution with which oral information on such points should be received. The accounts I obtained were not elicited by any formal queries, or by giving the persons addressed any idea of the object in view; but in the course of daily interviews, and by friendly intercourse with them; and all my questions were casually introduced in the course of desultory conversation.

I have been on friendly terms with at least ten of these persons, who were on their way to perform pilgrimage at Mecca; and where I had any doubts regarding the authenticity of information received from one, I took advantage, on a different occasion, to address myself, on the same subject, to another, and thus an opportunity was afforded to rectify any thing which might have been incorrectly stated.

My sole object has been to add, in any degree, however trifling, to our knowledge of a country so near our own frontier, and of which, at present, so little is known; and I trust I shall be excused, at least, in my humble attempt to imitate those great men MM. HUMBOLDT and KLAPROTH, who have been gaining information, in precisely the same manner, from natives of Chinese Tartary, who have resorted to Orenburg, or Orsk, on commercial pursuits, the result of which they have lately published at Paris.—W. H. W.

Chinese Tartary.—The province of Chinese Tartary contains, at present, nine towns of considerable magnitude, namely, *Yárkand*, *Kashgar*, *Auksú*, *Eela*, *Yengí Hissár*, *Ooch Túrfán*, and *Koneh Túrfán*, (which is sometimes called *Hami*,) *Gúmmí*, and *Lopp*.

Yárkand.—Of these, *Yárkand*, from the extent of its population, may be said to be the capital of the province, though, in a political point of view, each of the governors and Chinese residents of those towns exercises independent authority. *Yárkand* is described as being a flourishing and populous city. It has two forts: the principal one is of large extent, but its walls are of clay; and it is uninhabited; the other, which is rather smaller, has four gates, is inhabited, and is considered by the natives as very strong, being built of stone and chunam, and surrounded with a ditch. The suburbs extend over a considerable space. The population of *Yárkand* is said to consist of about 30,000 families, as found by a census made by the Chinese—each family consisting of from five to 10 persons. Only 200 Chinese merchants are fixed residents; but many other traders of the same nation resort to the city—departing after a temporary stay. There are also many Túngání merchants resident in the place, and a number of Chinese artisans. Many natives of *Kashmír* have settled at *Yárkand*, a very few Hindus, and some Shíahs, or, as they are called, worshippers of Alí; but no Jews or Nogai Tartars. The houses are generally one story high, and built of clay, which answers the purpose sufficiently well, as very little rain falls in these countries. *Yárkand* boasts of numerous mosques and colleges. There are two spacious bazars—one within the fort, and the other in the suburbs, besides other smaller bazars in different quarters of the city. Horse-flesh is sold in the butcher's shops, and generally eaten: it is not considered unlawful food by the people of the country, and generally sells for the same price as mutton. Kimmiz is not used by the inhabitants of the towns, but by the Kalmuks, and other roving tribes. The tenets of the Musalmán religion do not appear to be very strictly observed in Chinese Tartary; and the inhabitants seem to be much more tolerant than those of *Kokan*, and other places in Independent Tartary.

The Chinese government has a force stationed at *Yárkand*, stated to consist of about 7000 soldiers, partly Chinese, and partly Mandshus, or Mongols, of whom a portion garrison the forts; the remainder are cantoned outside the town, much like the English troops in India. The whole are under the orders of an officer, who has the title of Umbaun. There are no Túngání soldiers in Chinese Tartary; for, as they are Musalmans, the Chinese fear that they would,

being of the same religion, join the Usbeks in case of any insurrection taking place. The *Túngánís* live in the country, the chief towns of which are *Salar* and *Seiram*. ALEXANDER the GREAT is said to have penetrated as far as *Salar*, and to have left a colony of his soldiers in the country, from whom the *Túngánís* are descended. They derive the name from several Turkish and Persian words, in different ways, signifying, left behind, looking back, &c. &c. It is a general tradition, that ALEXANDER carried his conquests through this country, to the frontiers of China proper. The Umbaun, who is the Chinese resident, is the chief political, as well as military, authority in each district. The present Governor of *Yárkand* is ABDUL REHMÁN BEG WAUG, who is the nominal Usbek ruler of the country; but is, to all intents, under the most complete control of the Umbaun, who has sole authority over the regular Chinese troops stationed in the district.

There are many small towns and villages dependent on *Yárkand*. The whole district round it is said to be most populous, and is thickly interspersed with villages and hamlets. The country is described as very fertile also; and amongst its productions are enumerated wheat, barley, rice, gram, *jawárí*, *bajrí*, and various seeds from which oil is extracted. Melons, grapes, apples, and other fruits of temperate climes, are also abundant. A large portion, however, of the wealth of the people of the country about *Yárkand* is said to consist of flocks of the shawl goat, called by them *Akhchahs*, of which almost every landed proprietor possesses a large number. The dúmba, or fat-tailed sheep, is also common. Plantations of mulberry trees are very numerous, and great quantities of silk are produced.

Irrigation is said to be carried on to a great extent, the whole of the lands in the vicinity being plentifully watered by rivulets, and streams of water, flowing from the mountains.

Kashgar.—The city of *Kashgar* is the ancient capital of the province; but since the rebellion of JEHÁNGÍR KHOJEH, when its inhabitants suffered much from both friends and foes, it has fallen greatly to decay. *Kashgar* is the frontier station, and five days' journey from *Yárkand*; with a káfila it is six days; but with quick travelling the distance may be traversed in four. The city itself contains about 16,000 inhabitants: many towns, villages, and castles are also dependant on it, the population of which is very considerable. The Usbeck chief of *Kashgar* is named TAHI'RULDI'N BEG, who has not the title of WAUG; but his government is distinct from that of ABDUL REHMÁN BEG WAUG, the chief of *Yárkand*. He is, however, inferior in rank to the WAUG. Eight thousand Chinese regular troops are constantly cantoned at *Kashgar*, as a check on the Khán of *Kokán*.

Yengí Hissar.—On the road, about half-way between *Yárkand* and *Kashgar*, lies the town of *Yengí Hissar*, which is famous for its dancing girls and musicians, who are Musalmans, and resemble those of India.

Auksú.—Auksú is north-east from *Yárkand*, and distant about 20 days' caravan travelling. This town is represented as a very flourishing place, and a great commercial mart for the products of China and Russian Tartary. It is the residence of a *hákim*, named Ahmed, son of Oozak, whose authority is distinct from that of the other chiefs. He is an *Usbek*, and lower in rank than the Waug of *Yárkand*; and, in like manner, subordinate to the Chinese Umbaun. The number of Chinese troops in *Auksú* is 2000. The silver coin called *Tankeh*, the current money of the province, is struck at this place.

Eela, or *Gouldja.*—The town of *Eela*, which is also called *Gouldja*, is situated north of *Auksú*, distant 25 or 30 days' journey; but it may be reached in 20 by quick travelling. From *Yárkand* to *Eela*, the distance is greater, and ordinarily, a journey of 40 days. To this place, as also to *Yessik* and *Kouché*, the Emperor of China banishes criminals of magnitude, for three, five, seven years, or for life. Owing to the fertility of the surrounding country, fruit and grain are very cheap at *Eela*; and good horses, sheep, and dúmbas, may be had at very moderate prices. It is at this place, and the neighbouring country, that great numbers of the *Kalmuks*, or *Eleuth* hordes, have been located by the Chinese government. The climate is said generally to prove fatal to foreigners.

Kouché.—Kouché is situated north-west of *Auksú*, and south of *Eela*, at a distance of 40 days' journey from *Yárkand*, and about three months' journey from the Russian frontier. The population of *Kouché* consists chiefly of *Kalmuks*. The principal people of substance reside in the city, and the poorer classes in tents on the plains. These generally follow pastoral pursuits, and have numerous herds of cattle.

Ooch Túrfán and *Koneh Túrfán.*—There are two towns called *Túrfán:* one *Ooch Túrfán*, which is only two days' journey from *Yárkand* and *Auksú*; the other *Koneh Túrfán*, called also *Hami*, which is at a distance of two months journey from those places. *Koneh Túrfán* is a very ancient city; and remarkable for the fine grapes which are there produced.

Lopp.—Lopp is situated at a great distance from *Yárkand*. The inhabitants are principally Chinese; but few Usbeks reside there. *Lopp* is remarkable for a salt-water lake in its vicinity.

Gúmmí.—Between *Yárkand* and *Eelchí* (in *Khoten*) is the town of *Gúmmí*, the chief of which some time since was KURBÁN BEG, who was said to be in possession of the stone called "*Yedeh Tásh*," (rain-stone,) which, according to popular belief, possesses the extraordinary virtue of causing rain to fall, whenever it is placed in sweet water.

Khoten.—In the country of *Khoten* are the towns of *Karakash*, *Eelchí*, and *Kirrea*, besides many others of less magnitude. *Eelchí* was anciently called *Khoten*, but at present there is no town bearing that name, which is now applied to the whole district, of which *Karakash* is the capital; distant about ten or twelve days' journey from *Yárkand*. The district is governed by two Chinese Umbauns, or residents, to whom are subordinate two *Usbek hákims*; one in *Eelchí*, and the other in *Kirrea*. There is a Chinese regular force of 2000 men stationed in the district; and the number of subjects paying tribute is estimated at 700,000. The population is chiefly Usbek; but Kalmuks, or Eleuths, are also settled in large numbers in different parts of the country. The Musalmans are more numerous than the Buddhist idolators. The policy of the Chinese is said to be opposed to the adoption, by any of their nation, of the Muhammedan faith.

Eelchí.—Eelchí is 12 days' journey from *Yárkand*. In this town, and generally in *Khoten*, there are many Baudh priests and temples.

Kirrea.—Kirrea is five days' journey on horseback from *Eelchí*. At this town is a gold mine; the sand of the river which flows near it is also found to contain that precious metal. Two or three hundred labourers are always employed in the mines, which are said to be very productive. The produce of this mine is monopolized by the Chinese government.

Revenue and Trade.—The revenues of *Khoten* are said to exceed those of *Yárkand*. A considerable trade is carried on between these places by káfilas, which carry mushroo, satin paper, gold dust, silk, grapes, raisins, and other commodities, to *Yárkand*; whence they bring copper pots, leather, boots, &c. to *Khoten*.

Trade of Chinese Tartary.—A very extensive commercial intercourse is also carried on between *Yárkand* and the large towns near it, as well as with Kashmír, Badakshán, China, and the Russian territories on the north-western borders of the Chinese empire.

From Kashmír the natives of that country bring to *Yárkand*, shawls, *kincábs*, *chikun*, white piece goods, and leather; and take back *ambú*, or pure silver, the wool of the shawl goat, called *tibbút*, and other articles.

The merchants of *Fyzábád*, which is the capital of *Badakshán*, bring to *Yárkand* slaves, and precious stones, taking back silver and tea. The káfila, which comes once a year, is generally about 40 days on the road; but by forced marches, the journey may be performed in twenty.

From *Andejan*, in the Khánate of *Kokan*, piece goods and other commodities are brought viâ *Kashgar*; the return trade from whence consists of pure silver, China-ware, tea, in boxes and bricks. The brick tea is of a very inferior quality, and is used only by the poorer classes. This trade is carried on by means of horses, mules, and camels.

Káfilas come from the Russian frontier, by way of *Eela*, *Auksú*, and *Kouché*, bringing broad cloth, brocades, silver, gold ducats, copper, steel, furs, &c. and they take back tea, rhubarb, sal-ammoniac, &c.

Communication with Pekin.—From *Yárkand* it takes a caravan from four to six months to travel to *Pekin*, (which the natives call *Pechín*;) but by quick marches, the journey may be performed in three months. There is but one road to *Pekin*, which caravans, or travellers, can use; for though there is said to be another, and shorter, route, its use is prohibited by the Chinese government. In the way there is one very difficult pass, where 20 matchlock men may oppose a whole army. A party of Usbeks is stationed there. At every stage is a Chinese Ortung, or post, of seven or eight Chinese, and about 20 Usbeks. No passport is necessary for persons going from *Yárkand* to China; neither are they prevented from remaining there as long as they choose, the leave of the Emperor not being requisite for this purpose.

An extensive trade is carried on between China and *Yárkand*. Great quantities of silk, great numbers of cattle, &c. are taken to China; articles of China manufacture, porcelain, and especially tea, form the returns.

Road to Tibet.—From *Yárkand* to *Ladák*, (or little *Tibet*,) which is nominally dependent on China, is a journey of 30 or 40 days. The country on the way is inhabited for two stages, where Chinese Ortungs are met with, five Chinese and 20 Usbeks in each; but for the next twenty days, the country passed through is a succession of plains and mountains, without inhabitants. The people at the Ortung inspect the passes given by the Umbaun, and after stamping it with their seals, return it; but it is kept at the last post, and given back on the return of the party, which must account for absentees. These Ortungs, however, it is said, may be easily avoided. By forced

marches, *Tibet* may be reached from *Yárkand* in 17 or 18 days. Thence to Kashmír, it takes a káfila 25 days; but the journey, by quick marches, may be performed in 15; there is plenty of wood, water, and forage, on the road.

To Auksú.—From *Yárkand* to *Auksú* is 20 days travelling by caravan: and on the way are 17 Ortungs, at most of which there are seven Chinese and 13 Usbeks; but at some, there are more. The road passes through a very woody country.

Rivers.—There is a river near *Yárkand*, the name of which is *Zurufshan*. It is generally frozen for three months in the winter; when horses, camels, and men may pass over it. From the part of the country about *Auksú* two streams join the *Zurufshan*: one of them flows five kos distant from *Auksú*, and the other is seven days' journey from that place.

Climate.—In the summer, when the melons ripen, it is very hot in these countries; but during winter, it is extremely cold. In this season, a great deal of snow falls on the mountains, which are twenty days' journey from *Yárkand*; but in the city itself, very little falls. It rains very rarely, only twice or thrice in the year, for an hour or so; and then the weather becomes very cold.

Volcanoes—Sal-Ammoniac.—At the distance of 10 days' journey from *Auksú*, are two very high ranges of mountains, between which there is a valley, the surface of which, to a considerable depth, is covered with sal-ammoniac. There is a dreadful heat at this place, occasioned by a volcano, which, by the people of the country, is called "God's fire." The heat prevents them approaching it in the summer. During the eruptions, the sal-ammoniac is said to be thrown out, and showered over the valley, like mist, to the distance of one kos; it afterwards hardens, and becomes, during the winter, crystallized like ice. People go there in that season, cut it into convenient pieces, and carry it away. It is said, that near old, or *Koneh, Túrfán*, also, is a mountain, out of which flames of fire are seen to issue.

Earthquakes—Cholera.—The natives state, that about three years ago, there were constant earthquakes in the province; and that the cholera committed great ravages at *Yárkand*. In *Badakshán*, the earthquakes destroyed a great number of houses and people.

History of the Province.—About eighty years ago, the whole of the country was in the hands of the Kalmuks, or Eleuths; and there was one Túrah, or chief, in each district, as governor. The Kalmuks were subsequently conquered by the Chinese in the reign of KIEN LUNG, and the authority of the Emperor was established over the whole province. For a long period after that event, the Chinese

held it in possession, without any attempt being made, either by the Kalmuks to regain their lost authority, or by the natives, to assert their independence. Subsequently, however, the Chinese began to oppress the people to such a degree, as to excite much discontent, and a general feeling of dislike towards them. Taking advantage of this state of things, AI KHOJEH, a descendent of the ancient princes of the country, and a Syed of noble family, to whom the Kalmuks, as well as the whole of the Muhammedan population, were much attached, headed a rebellion against the Chinese, and opposed them with various success for some time; but was, at length, forced to retire before their superior number. The Chinese are said to have made a cruel use of the advantage they had gained, and massacred the Muhammedans in every quarter where the least resistance was apprehended.

AI KHOJEH, and his followers, finding it impossible to continue the contest, fled to *Badakshán;* but the prince of that country betrayed him, and gave him up to the Chinese, who put him to death. In retribution for this treachery, his country, the people of *Yárkand* believe, has been visited with the miseries that have since befallen it, and fell an easy prey to MUHAMMED MURÁD BEG, of *Kundáz*, who some years ago invaded and conquered it. When AI KHOJEH was thus delivered into the hands of the Chinese, his son, and his grandson, JEHÁNGI'R KHOJEH, fled to *Andejún*. Some years afterwards, AI KHOJEH'S son died, leaving his son JEHÁNGÍR KHOJEH, then a youth, under the care of the KHÁN of *Kokan*. About 10 or 11 years ago, observing how unpopular the Chinese had become, he formed a plan for regaining the possessions of his forefathers. Having succeeded in bringing over to his cause EESÁ BAHÁDUR, one of the influential men of *Andejún*, who joined him with a large body of the Khirgiz, and being supported also in his attempt by the KHÁN of *Kokan*, who sent a force of about 8000 horse to assist him; he advanced into Chinese Tartary, and attacked the Chinese in their cantonment at *Kashgar*. The Chinese, and YUNIS WAUG, who was then the Usbek hákim of *Kashgar*, took refuge in the fort; but the Chinese apprehending that this chief and the Muhammedans would join JEHÁNGÍR, put YUNIS WAUG, and many of the inhabitants, to death. This inhuman proceeding, however, failed of its object; for it did not deter the rest of the inhabitants, who were Musalmans, from going over to JEHÁNGÍR; who, thus strengthened, attacked the fort, and carried it by storm: the Chinese, who were taken by surprise, being either driven out, or cut to pieces.

JEHÁNGÍR KHOJEH then marched to *Yárkand*, where also he was well received by the inhabitants. The Chinese, after sustaining several defeats, abandoned the country. Encouraged by his success, the KHOJEH then proceeded to *Khoten*, and expelled the Chinese from that province. Whenever he made his appearance, the Chinese either gave way, or, resisting, were put to the sword. Thus JEHÁNGÍR acquired possession of the whole country, which remained in his hands for five or six months; but, abusing his power, he tyrannised over the people, and oppressed them. He became, in consequence, disliked, and was not supported by the inhabitants in opposing the Chinese, who returned with an army estimated at about 60,000 men, besides many Kalmuk horse. Being unable to check their progress, the KHOJEH retired to the mountains, and his *Khirgiz* and *Andejún* allies retired to their own countries, carrying away with them property of immense value, of which, on the approach of the Chinese, they had plundered the inhabitants. Shortly afterwards, ISHÁK KHOJEH, of *Kashgar*, being jealous of JEHÁNGÍR, betrayed him into the hands of the Chinese general at *Auksú*, by whom he was sent to *Pechín*, (*Pekin*,) where he was put to death by order of the Emperor. For the service which ISHÁK KHOJEH had rendered, he received from the Chinese, the office and title of WANG, or prince of *Kashgar*. The real cause of the defeat of JEHÁNGÍR KHOJEH was, that the Usbeks of Chinese Tartary were divided into two tribes, the *Ak Tak*, to which he belonged, who are of the *Naqsh-bandí* sect, and the *Kura Tak*, who are *Kadarís*, and who never cordially joined the other. ISHÁK KHOJEH was the chief of the latter. Sometime subsequent to his being appointed governor of *Kashgar*, he was called to *Pekin*, but never heard of after. It is supposed the Chinese were afraid of his influence, and that he was got rid of by poison.

Revenue—Albaum, or Land Tax—and Customs.—The revenue derived by the Chinese, or rather the payment made to them by their subjects in Chinese Tartary, is denominated "Albaum," which consists of a capitation tax of one rupee from each man, per month, and a tenth of the produce of the land.

Syeds, múllahs, pírzádehs, faquírs, soldiers, &c. are excused from paying the "Albaum," according to the laws of GENGHIS KHÁN. Formerly, land customs were levied on merchandize in transitu through the province; and were collected at the rate of $2\frac{1}{2}$ per cent. on the value, (or as the narrator described it, "1 in 40, that is, of 40 pieces of cloth, one was taken;") but, about twelve years ago, this duty was entirely abolished, by order of the Emperor of China, and merchandize now passes free of impost.

Population and Language.—The native population of the country is Usbek, divided, as before stated, into two distinct classes, the Ak Tak, and Kura Tak. The language generally spoken is the Jaghatai Turkí, which the Kalmuks also understand. This is probably the purest dialect of the Turkí language, there being less admixture of Arabic and Persian, than in any of the others. A collection of a few common words will be found annexed to this memoir, which will show its great affinity to the other branches of that widely diffused tongue.

Chinese Troops.—The military force stationed by the Chinese in their provinces, is said to amount to between twenty and thirty thousand men.

Nature of the Government.—The Chinese government is represented to be very unpopular, at the present time, throughout these countries. There seems to be nothing in its system calculated to conciliate, or productive of advantages tending to reconcile the people to subjection to foreigners. The feeling of dislike, with which the Chinese are regarded, has been latterly much increased, in consequence of their carrying on vast works of fortification, and building walled towns, by the forced labour of the natives. The Musalman princes, chiefs, &c. are said to occupy, by the natives who had passed through India, nearly the same political position under the Chinese residents, or Umbauns, and stand in the same relation to them, as they supposed the Nawábs, Rájas, &c. of this country do to the residents of the English government, the Chinese interfering little in the direct management of the people, and leaving to the native princes the administration of the government and laws. The revenue, however, is realized entirely by the Chinese, the princes, &c. having large landed assignments.

English in India.—It is known at *Yárkand*, that India is governed by a nation of Europe (Feringís); and, it is said, that the Chinese entertain a high notion of the power of the English, which they view with feelings of apprehension, connected with an idea, that is prevalent in the country, of its being destined to fall into their hands.

Chinese Tartary accessible to European travellers.—It is said, that provided a person would dress as a native, allow his beard to grow, and accompany pilgrims on their return from Mecca, there would not be much difficulty in penetrating into Chinese Tartary; but that the easiest way would be by way of *Kokan* and *Kashgar*, as large káfilás of merchants pass that way. The person must, however, be able to speak Turkí, as very few of the natives of the country understand Persian; whereas, in the *Kokan* country, in Independent Tartary,

the population of whole towns speak nothing else. It would not be difficult for the individual to go even to *Pekin*, in China. All that is requisite is to get a pass from the governor, by paying a few tenkehs to the Chinese officers, giving out that his object is trade. My informants stated, that some years ago, a European made his appearance at *Yárkand*, in a native dress. He was discovered accidentally, and brought before the governor, who threatened him with torture if he did not confess who he was; but assured him that he would be well treated, if he spoke the truth. He admitted that he was a European, and was sent out of the country.

The foregoing particulars were elicited from various natives of the country, and at different periods, as they happened to arrive at Bombay, in their way on a pilgrimage to Mecca. One of these individuals was a prince of the country, another a *pírzádeh*, both persons of considerable education and information: the first was a native of *Auksú;* the second had travelled to *Badakshán, Kurratigin, Derváz,* and *Kokán*. Another was an inhabitant of *Eelchí*, in *Khoten*.

At the time this information was collected, I had not seen the works of Lieut. Burnes, or Timkowsky, nor the papers by the Baron Humboldt, and Monsieur Klaproth, in the Journal Asiatique.

It is remarkable, however, and perhaps, may add to the value of this information, that the accounts given me generally corroborate those of the above-named distinguished characters, with the exception of what Lieut. Burnes' informants told him respecting the troops in Chinese Tartary being Túngánís, which mine say is not the case; and the reason given by them seems to prove the truth of their assertion.

Collection of Words of the Turkí dialect, spoken at Yárkand.

Water	*Su*	Well	*Kuduk* and *Kulduk*	Light	*Taghatteh*
Fire	*Ot*			Far	*Zirák*
Smoke	*Chakàn*	Salt	*Tus*	Near	*Yakin*
Steam	*Ohàk*	Ghí	*Siriluja*	High	*Agis*
Man	*Ar Kisheh*	Milk	*Sut*	Mountain	*Tùgh*
Woman	*Mazlam Kisheh*	Dog	*It*	Valley, or Pass,	*Dawàn*
Girl	*Kiz (billa)*	Cat	*Mushshak*		
Boy	*Oghal (billa)*	Horse	*A't*	Head	*Bàsh*
Red	*Kizzil*	Sheep, Dúmba,	*Koyi*	Mouth	*Yaghis*
Black	*Kara*			Nose	*Baxùn*
Green	*Yashil*	Cow	*Galleh*	Hair	*Tik*
Yellow	*arak*	Ox	*Oyi*	Foot	*Put*
White	*A'k*	Bull	*Bokakeh*	Ear	*Kullàk*
Good	*Abdàn*	Camel	*Togheh*	The goat producing the Kashmír wool	*Akhchèh*
Bad	*Yamàn*	Ass	*Ashakr*		
Old	*Aski*	Mule	*Khacha*		
New	*Yengi*	Dark	*Kàràngo*		

Arm	*Kul*	Ice	*Muz*	Five	*Bash.*
Sun	*Kiùn*	Snow	*Kùr*	Six	*Alteh.*
Moon	*Ai*	Rain	*Yamghùr*	Seven	*Yetteh.*
Night	*Kùcheh*	Deer	*Kìk*	Eight	*Sakis.*
Star	*Yeldùz*	Road	*Yòl*	Nine	*Tokus.*
Year	*Yel*	A Sheep	*Koì*	Ten	*On.*
Stone	*Tùsh*	The wool used for making Kashmír Shawls	*Tibbit.*	Twenty	*Yegirmi.*
Silver	*Gumish*			Thirty	*Otus.*
Gold	*Altùr*			Forty	*Kerk.*
Iron	*Tumir*			Fifty	*Alek.*
Wool	*Yung*			Sixty	*Altmish.*
Fool	*Tukheh*	One	*Bir.*	Seventy	*Yetmish.*
Sister	*Saulin*	Two	*Iki.*	Eighty	*Saksen.*
Brother	*Yanìm*	Three	*Uch.*	Ninety	*Toksan.*
Wind	*Shamàl*	Four	*Tut.*	Hundred	*Yuz.*
				Thousand	*Ming.*

VERBS.

To give	*Birmàk.*	To sell	*Satmàk.*
To take	*Almàk.*	To eat	*Kich kanch almak.*
To speak	*Dimàk.*	To buy	*Satab almak.*
To strike	*Urmàk.*	To drink	*Ichmak.*
To carry	*Makmàk.*		

II.—*Some Account of the Hill Tribes of the Piney Hills in the Madura District. Extracted from the MS. Journal of the late Major* WARD. *Madras European Regiment, communicated by Capt.* T. J. TAYLOR,

The primitive inhabitants residing in the Varshagherry and Kumnundaven mountains, are the Kunnuver Villálers, in number amounting to about 4000 of both sexes, who resorted to them, it is supposed, about four centuries ago. They may be classed with the Villálers of the plain, yet differ in their habits and manners, scarcely having any intercourse with each other, or forming any connection by marriage. This latter circumstance may, however, in some degree be attributed to the difference of climate, the extreme cold of which the inhabitants of the low lands are unable to endure. It is still more singular that even among themselves they have peculiar habits and customs, which distinguish those in the east from their western neighbours: the latter consider themselves as something superior, and have no communication with each other. In their marriages, the Kunnuvers of the east invariably use a teak-wood stool when performing the ceremony by way of distinction: those of the west are not so particular, the bride and bridegroom are seated on stools, the floor of the house being previously garnished with cow-dung, and fantastically ornamented with streaks of flour. When the operation of sprinkling saffron-water is over, the husband performs the most important part of tying the tally, a small golden ornament, around the neck of the bride; the whole concludes with an entertainment to the relatives and friends of

both parties. The *Puryum*, or marriage gift, to the relations of the bride, is a pair of oxen; to the west only one bullock, and sometimes a cloth, as a present to the mother of the bride. Incontinency is however very predominant, and separation between man and wife, not unfrequent, subject often to caprice. If a man feels an inclination to alienate himself from his wife, he has only to make his intention known to her parents, who receive her back with an offer of a pair of oxen. To the west she is turned over, simply with a *Vatti*, or metal dish, in use, to eat victuals out of. In case a woman is displeased with her husband, and absolutely wishes to part from him, she is at liberty, only she must leave all her golden trinkets, if she has any, to her husband; those of silver she takes, being considered as her own property. To the west, however, the wife is only permitted to take back such articles as she may have possessed before marriage, and if she has any children, they are left behind as the sole property of her husband. Should such separation take place, when the woman is in a state of pregnancy, (and in the interim, be married to another man,) the child then born must revert to the legitimate father. The care and expense of weaning it, to the east, is recompensed by a donation of 30 fanams; towards the west, it is delivered to the father, on his demand, and no recompense made: the children of such a connection are allowed to grow up, and then as if by instinct return to their real father, who is bound to receive and protect them. A woman may marry as often as she chooses, but can have only one lawful husband at a time, though she may bestow her favors on another, provided he be of the same caste: any sexual connection with a man of another tribe would tend ultimately to expel her from the caste. A man may marry, if his circumstances will admit, as many wives as he pleases; for concubinage is not permitted: and to a man of some opulence, two or three women are necessary in his domestic affairs; they are also very useful in the fields, as the toilsome labour of weeding and watering devolves chiefly on them. Among the western Kunnuvers, a circumstance rather singular is supposed to prevail, in case of an estate devolving on a female, which is likely to occur from the default of male issue; she is prohibited marriage, but undergoes the ceremony of being betrothed to some part of the dwelling; she is however allowed to have an intercourse with the opposite sex, and to the offspring of such a connection, if a male, the estate devolves. The women of the eastern parts are very uncouth, and wear brass and metal necklaces, with a profusion of bangles on their arms and legs, and bore the membrane between the nostrils; the latter is also peculiar to the women of the west, who are

rather superior, and more modest in the wear of ornaments: a few stone or glass beads around the neck, called Kulpashy, and rings, are their only decoration; they wear a white cloth, not very clean, from above the shoulders, knotted in front, and made fast round the waist with a bandage; those to the east wear theirs similar to the females of the low country. The men are very simple in their finery, having a couple of cloths, one worn round the head, and the other about the waist; they seldom or ever wear sandals, and by way of ornament, display a few golden trinkets, pendent from their ear. Their dialect is the Támul, which they speak fluently; but are otherwise illiterate. The Kunnuvers burn their dead, with the exception of barren women, and those who may die of the small-pox, who are buried.

The Kárakat Vellálers.—This class of people are the primitive inhabitants of Anjínad, or five counties, or portions into which this division appears to have been divided on their first settlement in these regions: they are considered a people of superior caste, their custom and manners being indicative of it, though not in any manner esteemed above those of the same caste in the low country. A bráhman usually performs the duties at their temple, and the other ceremonies, &c. &c., as marriages, &c. are performed by a *Pandarun* or priest of their own caste. They speak the low Támul, but are most of them illiterate. A Támul school of late has been established at Muraúr. They are a very abstemious race. Rice constitutes their principal food, as also tyre, milk, and butter. They have no aversion to fowl or animal food, and use ghí as a substitute for oil; with it they also anoint themselves previous to bathing. They are not addicted to spirituous or fermented liquors. Opium is in use among them in moderation, and they chew and smoke tobacco. The apparel worn by both sexes does not differ in the least from the inhabitants of the plains, and consists chiefly of coarse white cloths; the women, besides the small ornaments worn in the nose and ears, decorate their arms with silver bangles, and such whose circumstances will not admit of their being of silver have them made of brass. A few of the men have the exterior membranes of the nose bored; and all invariably decorate their ears with rings: sandals for their feet are prohibited them. They are known to associate with the Kunnuvers, to the east: though their customs and manners greatly differ. Both castes make no scruple about eating what is cooked by either. But a Kunnuver, when invited to an entertainment by a Karakat, is not admitted to that part of the house, where the meats are dressed, nor is he allowed to touch any of the cooking implements. This class, by the laws of their sect, are contracted in marriage, when very young; it however happens, when the parties

are at an advanced age, (owing, it is said, to a deficiency in the number of females,) that some of the men are obliged to lead a life of celibacy. A plurality of wives is not uncommon. It is only admitted, however, in case the first proves barren ; but a connection of such a nature cannot take place without the consent of the first wife, which must be obtained eventually. A widow is by no means restricted, she being at liberty to marry another man, if she feels inclined to do so. It is not uncommon for them to prefer remaining in widowhood. Chastity among the fair sex does not appear to be a leading virtue among them; they are supposed, unknown to their husbands, to bestow favors on their male relatives, as well as on their neighbours. But in the event it is ascertained, that a female has had sexual connection with an individual of a lower caste, she is immediately expelled, and banished beyond their limits, when she becomes the property of some Kunnuver, who is always happy to afford her an asylum : in case an individual of this class debases himself by cohabiting with a woman of another caste, he also undergoes the sentence of banishment from his native soil. In the primitive times this crime was punished with death. The marriage ceremony is performed at the house of the bride : a Pandál being raised before the door, under it the parties about to be consummated undergo oblation : they then retire into the house, and are seated on the floor, previously garnished, with their faces towards the east; a lamp is kept burning on a stool, also a measure full of paddy, and a symbol of Vignashner, made of cow's dung, on the head of which are stuck two blades of the Acruvumpulla grass, to which the bride and bridegroom prostrate themselves ; on rising, the relatives present the Tully, a small golden trinket, to the bridegroom, who ties it round the neck of the bride. A bason of milk being introduced, in which are steeped some areca leaves, ficus religiosa, with some of which the elder relations sprinkle the heads of the bride and bridegroom ; they then get up and prostrate themselves before their joint relations, and the marriage concludes with an entertainment. On distributing betel and areca to the company the bridegroom, accompanied by his bride, retires to his own house, where the day after he entertains his friends and relatives. The *Puryum* or marriage gift is 30 fanams, and a cloth given by the bridegroom to the bride's relations. The money is converted into jewels to adorn her person. Estates invariably devolve to the eldest son. In case there be two or more, the property is equally distributed among them. They purchase the polians as slaves; price of a male 30 fanams ; that of a female, 50. She is considered of more value on account of the children she may bear, who when born are the property of the master.

III.—*Notice of Ancient Hindú Coins, continued from page* 640. *By* JAMES PRINSEP, *Secy. &c.*

Plate L.—Hindú coins of middle age.

To whatever period it may be finally determined to adjudge the series of *Gupta* coins described in my last paper, there can be no hesitation in regard to the first group of the present plate; though here again, had it not been for inscriptions relating to the same period, the absence of credible history would have left us as much in the dark as ever.

These coins are found, like the former, in greatest abundance in the vicinity of *Kanouj*. Ten of them were picked out of a remittance from the Cawnpur collectory. The Asiatic Society possesses some found at Allahabad by Dr. A. TYTLER; I have several from *Azimgarh*, and other places, besides four of gold in KERÁMAT ALI's collection from the Panjáb; Col. SMITH, Dr. SWINEY, Lieut. CUNNINGHAM, also possess specimens, and I have examined those in Col. WILLOUGHBY's cabinet; but the most plentiful supply, of gold, silver, and copper exists in Col. STACY's cabinet, whence I have selected most of the specimens now engraved.

It is rather singular that no mention of a species of coin comparatively so common, is to be found in MARSDEN's Numismata Orientalia. The only published drawings of them are, I believe, those accompanying Mr. WILSON's notice, in the seventeenth vol. Asiatic Researches, which were taken from coins in his and my own cabinets. This gentleman was the first to attribute them to their rightful place in history, although he had but one well ascertained name (*Govinda Chandra*) to guide his judgment. Upon a careful examination of the several collections mentioned above, I have now succeeded in adding five new names to his list, so rapid is the progress and success of the efforts now directed to this line of research.

The figure on the obverse of all these coins is of precisely the same character;—a rudely executed front view of a male or female (it is difficult to say which), seated in the native fashion, with a glory round the head, and some unintelligible objects in her hands. Prof. WILSON names her LAXMÍ, on the ground that the princes of the Rahtore dynasty were of the *Vaishaví* sect. In this case, we may recognize in her the female holding the cornucopia of the former Canouj group, sadly altered for the worse in point of execution.

The inscriptions on the reverse are, with one exception, easily legible; they are in a much more modern form of Devanágarí than the last, differing little from the present style, except as to the vowel inflection *e*, which falls behind the consonant to which it is attached, as in

Hindu Coins - 2nd Canouj Series.

J. Prinsep sc.

the *Gaur* or *Bengálí* alphabet. The same remark applies to the letter *j* (fig. 8), which assimilates to the Bengálí and Tibetan forms, and serves admirably to shew the transition of this letter from its original shape in the most ancient alphabet where it closely resembles the Roman E, to its present modified form ज.

The figures in my plate are not placed with any regard to chronological order, but rather according to their comparative frequency of occurrence: figs. 1 and 2, being by far the most numerous of the set.

On figure 1, we make out the words श्री मद्जा ड्डेयदेव ॥ *Srí mad Jádjèya dèva.* This variety is comparatively common in *gold.* Lieut. CUNNINGHAM has one of silver.

On figure 2, the most common of the class, are the very distinct words श्री मद्गोविन्दचद्रदेव ; *below* the letters वि and च are dots, which supply the place of the *n* or *anusvara,* so that the full reading should doubtless be श्री मद् गोविन्द चन्द्रदेव, *Srí mad Govinda Chandra dèva;* the gold of some specimens of this variety is of inferior quality.

Figure 3 is the one I have noted as being difficult so decypher. I have as yet only found one of the sort; it is of Col. STACY's cabinet. The letters visible are श्री मद्रा मचवेचे णम, *Srí mad Ráma havè che nam.* The व may possibly be an र, making the reading *Ráma Hari;* but we must wait the discovery of duplicates before we can complete or rectify this uncertain name.

Fig. 4, (KERÁMAT ÁLI') is more easily legible, श्री मत्कुमरपाल देव *Srí mat Kumara Pála dèva.*

Fig. 6, from the same collection, is a small coin of the same prince.

Fig. 5, is equally distinct, श्री मन्महीपाल देव *Srí man Mahí Pála dèva.* It is from a single coin in Col. STACY's collection.

Figs. 7 and 8, (STACY,) one of copper, the other of silver, help to decypher one another. The complete legend is श्री अजय देव *Srí Ajaya dèva.*

Lieut. CUNNINGHAM has sent me an impression of a copper coin of the same class, on which the name appears to be श्री मदल मी देव probably *Srí mad Laxmi (Pála or Chandra?) dèva.*

It was, as I have said above, the occurrence of the name of GOVINDA CHANDRA DE'VA, which led Mr. WILSON to ascribe this group to the *Ráhtore* princes of *Canouj,* who held the sceptre of that ancient city for a century prior to the overthrow of their last and best known Rája, JYCHAND (*Jaya Chandra*), by SHAHÁB-UD-DIN. One of our coins undoubtedly belongs to the former prince, and it may perhaps be allowable to give the last two, figs. 7 and 8, to JYCHAND himself, whose proper name may have been *Ajaya Chandra dèva;* the family

name *Chandra* being frequently omitted both in writings and in inscriptions. But the remaining coins of our series, two of them having the family name *Pála*, cannot be reconciled with any of the princes in the short *Ráhtore* line, of which every individual from the first conqueror CHANDRA DE'VA, in A. D. 1072, is known to us through the concurrent testimony of several inscriptions. What was the antecedent dynasty? has been a question hitherto imperfectly answered; the traditions cited by Colonel TOD being, as stated in my last paper, at total variance with inscriptions. The latter indeed only record two names, YASOVIGRAHA (or *Srípála?*) and MAHICHANDRA prior to the conquest of CHANDRA DE'VA. The latter of these should probably have been MAHIPÁLA, of whose reign in the early part of the eleventh century, the inscriptions at *Sárnáth*, *Dinájpur*, and *A'mgáchí* supply ample evidence, now indeed confirmed by the superscription of his coin in fig. 5. YASOVIGRAHA, in like manner, may be referred to the VIGRAHAPÁLA DE'VA of the *Dinájpur* inscription, and thus the sur-name of *Pála* may be restored to both these princes.

Although *Gaur* in Bengal was the original seat of the *Pála* family, there is no reason to doubt that they had acquired the paramount sovereignty of India, and that the seat of their government was fixed for a time at least in Canouj. Indeed, branches of the same family may be traced to the westward—to the *Pálas* of Málwa, one of whom (ANANGAPÁLA) rebuilt Delhi, or re-established it as his capital; and perhaps even to Guzerát, where we find the occurrence of a KUMÁRA PÁLA, in 1100, who may probably be the owner of our coin, fig. 4, especially as his son is named AJAYA PÁLA, who may be the AJAYA DE'VA of figs. 7, 8. In evidence of the identity of this family, it may be sufficient to note a few facts, referring to the elaborate observations of WILFORD, and the subsequent notices of COLEBROOKE, and those of FELL, and WILSON, in the 15th volume of the Asiatic Researches.

The list of the kings of *Gualior*, noticed by WILFORD, consists of 85 names, all having the affix of *Pála*, "*in accordance with the prediction of Guapála the hermit, their progenitor**." Now the founder of the *Gaur* family of Bengal is equally a *Gopála*, though some authorities call him *Bhupála*, a name of much the same import, and denoting his rustic extraction.

Again, the grandson of ANANGAPÁLA, the *Tuár* conqueror of Delhi, is stated to have returned to *Gaur*, "*his native country*," after the defeat and death of PRITHIVI PÁLA, or PITHAURA. Thus ANANGAPÁLA too was of the Bengal family: moreover he was either the grandson or the fifth in descent from *Chandra Pála*†, or *Chaitra Pála*‡, of *Málwá*,

* As. Res. ix. 154. † Ayín Akberí. ‡ WILFORD.

"who swayed all India," after JAYANANDA: and the Musalmán writers affirm that "after *Gebál* (or *Chait Pála*), the *Balhára* kings of *Guzerát* became paramount emperors of India*." It is not, however, absolutely necessary to travel so far to the west for a *Kumára Pála*, since in ABUL FAZL's list we find a prince of this name immediately following ANANGAPÁLA in *Málwá*; and FERISHTA also makes a KUNWER RAY (rája *Kumára pála*) reigning at *Canouj* on the invasion of MAHMUD. There is evidently some connection between all these different dynasties, and although the subject is now involved in almost inextricable confusion, from the discrepancy of the several lists in the *Ayín Akberí*, in RAGHUNÁTH's *Rájcvalí*, and in the *Agní Purána*, we may hope, through the fortunate discovery of the present coins, and others that we may now confidently hope will succeed them, to arrange the names in a satisfactory and coherent manner. It is evident that the *Canouj* mint produced this series continuously, as the alphabetic type is preserved through the whole unaltered. It will be seen presently that the same distinctive characters appear at a particular point, both in the coinage of *Guzerát*, and in that of *Chitor* or *Mewár*; and in both cases sufficient of the name remains visible to shew that it terminates in *Pála dèva*, and therefore, that it marks the spread and paramount sovereignty of the *Gaur* family across the whole continent of India.

Figs. 13, 14, 15, 16, are silver coins found in abundance in many parts of India, but chiefly towards the desert to the west of Delhi. Colonel STACY's cabinet is rich in them. Mr. WILSON's plates exhibit others from Colonel MACKENZIE's and my own collection. They weigh on an average 50 grains, or three *massas*.

On the obverse is a figure of the boar, or the *Varáha avatár* of VISHNU, and the *chakra* or discus of this god is visible on many of the specimens. The character on the reverse is again of quite a new form. Instead of the square-built *Gaur* alphabet, or the *Gujerátí* letters, we have here the nail-headed letter common to the inscriptions of the *Takshac*, *Jit*, and *Morí* princes, of *Haravatí* and *Málvá*, described in TOD's Rájasthán, App. vol. I. which belong chiefly to the 7th, 8th and 9th centuries. This vague coincidence may help in assigning the place and period of their coinage, which otherwise there are no data to trace. The full legend of the coins, made out from collation of the engraved figures and from many others in Colonel STACY's cabinet, is श्री मदादि-वराह: *Srí mad ádi Váraha*, which is nothing more than the title of the incarnation, and affords no clue to its appropriation. Below the

* WILFORD, As. Res. ix. 164.

legend is in general visible a square or oblong central ornament, with two balusters on the sides: their intent is beyond my apprehension.

Fig. 17, differs from the preceding in the reverse, although its general similarity and its being found in company shew it to belong to the same family. The two baluster-looking ornaments again meet the eye—on the reverse is the initial word श्री *Srí*, and below it यो or पो, *yo* or *po*.

The flourish on the left hand is evidently intended for a human face viewed in profile.

In 18, the word *Srí* is again very distinct, but the head of the *boar-god* is also apparent. In the Society's plate, I was the cause of Mr. WILSON's mistaking the word श्री for the letter ङ reversed, from my having engraved the figure upside down.

In 19, and 20, the human profile is better defined than in 17. The contour of the ear, cheek and shoulder may be distinguished; the eye, nose, and lips, are represented by dots. In 20, the word *Srí* is still discernible.

On the reverse is a single letter, either *k*, *s*, or *m*, amidst flourishes.

In 21, the boar again appears, with the letters वह *vaha* or perhaps एक *ek*. Of this sort, a quantity were dug up while I was at Benáres, by Mr. TAYLOR, judge of *Mirzapur*, near *Sultánpur*. Mr. GUBBINS found several at *Gurgáon* to the south-west of Delhí.

It seems impossible that coins so plentifully found in Upper India should have been struck in the peninsula, or we might from the device and superscription attribute them to the *Vijyanagar* sovereignty; for Colonel WILKS informs us, that "*Varáha*, the boar, one of the incarnations of VISHNU, was the emblem which these rájas adopted, as the impression on their *gold* coins, and the coin was and is named *Varáha* in consequence, in the Hindu languages of the south." The restriction however of this name to the small gold coins or *huns* of the south is against this hypothesis. One of the Vijyanagar *Varáhas* (of DEVA RAYA?) is depicted as fig. 80 of Mr. WILSON's plates; and though the attitude of the *avatár* is a rude imitation of ours, the form of the Nágarí character is there essentially different, and much more modern.

Similarity of name might tempt us to assign them to the *Varáhas*, a powerful Indo-Scythic tribe to the west of Jesalmèr, who were frequently in collision with the Bhattis in the eighth century, or the foundation of Tunnote*. But it does not appear from Col. POTTINGER's description of them, under the name of *Brahooes*, that these were ever

* TOD's Rájasthán, ii. 229.

of the Hindu faith, whereas the emblem and inscription could have proceeded only from an authority strictly *Vaishnaví*.

Fig. 22, from the STACY collection, would appear to be an interloper in the Upper Provinces; since the majority of this type have hitherto been found in Ceylon, some in the palace at *Candy*, others by Colonel McKENZIE at *Dipaldinna*. They all however belong to the genuine Hindu rájas of that island, judging from the alphabet and the name.

The rude outline on the obverse, is intended, probably, for a rája holding some mace or warlike weapon in his right hand. On the reverse he is seated in a lounging position, with a view to make room for the inscription on the side. This in the specimen before us is श्री मया चय मल्ल *Srí mayá traya malla*. The second word is read by MARSDEN, in a specimen very like it, दय *daya*. And on another coin he finds the name of VIJAYA विजय (मल्ल?) well known in the history of Ceylon. Mr. WILSON does not attempt to read the names on his coins, which are badly drawn; but on comparing them, they appear not essentially to differ from Colonel STACY's. No family of the name of *Malla* occurs in the Indian genealogies except in Nípál, where, from the 13th century to the Gorkhá conquest, the reigning prince almost always bore the affix of *Malla*. In the honorable Mr. TURNOUR's catalogue of the Ceylon monarchs, I do not find any such name.

Figs. 24 and 25, are two more modern copper pieces, selected from many of a similar nature in Colonel STACY's cabinet, as forming a good land-mark in judging of the antiquity of other Hindu coins. The rude attempts at a human figure in 24, are far inferior to any thing we have yet seen, unless in its companion 25, where we can hardly pronounce them to be other than signs and symbols. The name and date on most of these coins are distinct enough, and in the present type of *Nágarí*, श्री संग्राम सिंह १५८०, *Srí Sangráma Sinha*, 1580 *(samvat)*. Sometimes the name is written संग्रम, and at others संगम, *Sangrama* and *Sangama*, variations to be expected in such imperfect samples of the engraver's art.

Fig. 27, is of the latter description, having the name *Sangama* preceded by the letters भकग. The reverse of this coin has the figure of a heart, which is very common on copper money dug up in the Ságur district, of the Muhammedan princes of the Berar provinces. Arabic letters are clearly distinguishable above the heart.

From the date of these coins, we recognize them as belonging to the celebrated SANGRÁMA SINH, or SINKA of the Moghul historians, who for a short period successfully resisted the victorious BABER at Biána.

A romantic account of the chivalrous adventures of his youth is given by Colonel TOD*. He succeeded to the throne of *Mewár*, in S. 1565, (A. D. 1508,) and is accounted by the Rájpút bards the "*kalsa*," or pinnacle of its glory. His encounter with BABER at Kanúa occurred on the 5th Kartik, S. 1584, (=15th October, 1527,) four years subsequent to the striking of these coins, which, by the way, are no very convincing evidence of the flourishing state of the arts in *Chitór* at the summit of its splendour and glory.

Fig. 26, is a small square copper coin in Colonel STACY's cabinet, also of modern fabrication; on one side inclosed in a marginal frame, which proves that the whole inscription is before us, are the Nágarí letters एक लिस *èk lis*. It may be that *lis* is the name of a coin of which the specimen represents the unit; or possibly it should be read एकालिस *ekális*, the fortieth or rather forty-first of the current silver coin of the place? The division of the field on the reverse into upper and lower compartments, so far resembles a gold coin from Canouj, described by Mr. WILSON, as fig. 52, Plate III. The letters are कभ कंखी an unintelligible compound.

Fig. 28, is another rude Hindu paisa of a late period. A human figure on the obverse, holds a staff in his right hand; on the reverse are the letters व स ण स र जो *basan sar ji*, an unknown and doubtful name.

Plates XXXVI., XXXVII. Rájput Coins.

In the two following plates, I am again indebted to Colonel STACY's numismatic zeal for the greater part of a very curious series of Hindu coins, on the one hand linked by the subject of their impression with the Indo-Scythic series, and on the other gradually mixed with and transfused into the Arabic currency of the first Mohammedan conquerors of Central India.

Now that I am myself in possession of nearly 100 of these coins in silver, it appears strange that they should hitherto have escaped so completely the notice of our Indian numismatalogists; neither MARSDEN, WILSON, nor TOD, having published a single engraving of them. When therefore I first received a sealing-wax impression of one from Dr. SWINEY, in August, 1833†, it is not surprising that I should have announced it as an *unique*. Colonel STACY's letters soon taught me to consider it in a very contrary light, and now on reference to Colonel TOD's personal narrative, I find that they had

* Rájasthán, i. 295.

† See Journal, Vol. II. page 416, and fig. 11, Plate XIV. of the same volume: I then supposed the coin to be of gold; it was of silver.

not escaped him in his travels, although he has not favored the public with any drawings of them, or any comments on their age and locality.

Munshí Mohan Lál's collection of coins made at *Cábul*, afforded me a favorable opportunity of ascertaining the accurate names and readings of the silver group, but unfortunately these do not embrace so much variety as the copper coins. The reason for this may be, that the munshi's collection was discovered in a foreign country. A treasure accidentally dug up, however numerous, would naturally consist of the money then current, with a small admixture of that of preceding reigns: in fact, out of 100 coins, 65 belong to one type (figs. 3, 4, 5,), 25 to another (figs. 1, 2,), and only three or four to a third (figs. 6,7,). Colonel Stacy on the other hand had the advantage of exploring the very field in which they must have been at one period current, and his series is, therefore, much more complete, though rarely so numerous in any particular species. A letter from this gentleman to my address, dated 2nd August, 1834, suggests, that "as the figures both on the obverse and reverse of these coins are evidently made up of letters, either of Sanscrit or some other Hindu characters, they should be submitted to the kind attention of the professors of the Hindu college. The great variety, and the general distinctness of the characters on them, holds out fair hopes of our becoming acquainted with the dynasty they belong to, as well as with many of the individuals of that dynasty. The names placed against each by pandits, to whom they have been shewn, are worthy of no reliance. The natives possess neither enterprize nor invention; when they find a letter or letters wanting, they will not attempt to fill up the blank."

The opinion here broached, that the outline figures were made up of letters, is supported by the authority of Colonel Tod, who remarks in the only passage I can find on the subject, (vol. i. p. 698.) "My envoys brought, from *Nadolaye*, a small bag full of curious hieroglyphical (if I may so use the term) medals of the *Chohan* princes. One side represents a warrior on horseback, compounded out of a character to which I have given the above term; on some there was a bull; while others, retaining the original reverse, have on the obverse the titles of the first Islamite conquerors, in the same manner as the currency of France bears the effigies of Louis XVI. and the emblems of the republic. Whoever will pay a visit to *Nadolaye*, will find his labour amply rewarded; I had only leisure to glean a few of these relics, which yet formed a rich harvest."

When the singular contour of the horseman and bull is traced back to its original type in figures 1, 2, where the whole substance of the

figure is filled up, there does not seem to be much reason for imagining any intention of mystifying the device, otherwise than by the clouds of ignorance; when the engraver retained only sufficient knowledge of his craft to cut the outline of his device in relief, and latterly even seems himself to have lost sight of its meaning altogether, as in figs. 48, *cum multis aliis*;—certain it is, that the title of hieroglyphic has been earned and won for this coin even from the antiquarians of the west; witness the following highly curious passage, brought to my notice by Dr. SWINEY, in an American work on scripture geography*, applied to a wood cut of a coin in all respects the counterpart of our figure 3, which may have found its way to Egypt, in the course of commercial dealings, eight or ten centuries ago:—

"This is an extremely curious medal, of silver, struck in Egypt before the reigns of the PTOLEMIES. It represents on one side, a man on horse-back, and on the other, an ox of the humped kind lying down: between his horns is the lunar crescent, and within that is a globe. These symbols clearly refer this ox to Egypt. The man on horse-back is the most singular part of this medal; none of the countries adjacent having adopted the type of a horseman. There is every reason to believe that the letters on this medal are Persian, and that the person represented is ARYANDES, governor of Egypt under DARIUS, the last king of Persia, who then possessed this country, and who caused the governor to be put to death for coining money in his own name"!!

It can hardly be believed, that the nature of the characters should have been unknown to any but Transatlantic antiquaries, for they are in a very obvious form of Deva nágarí, and may be easily read where the letters are not cut off or otherwise obliterated.

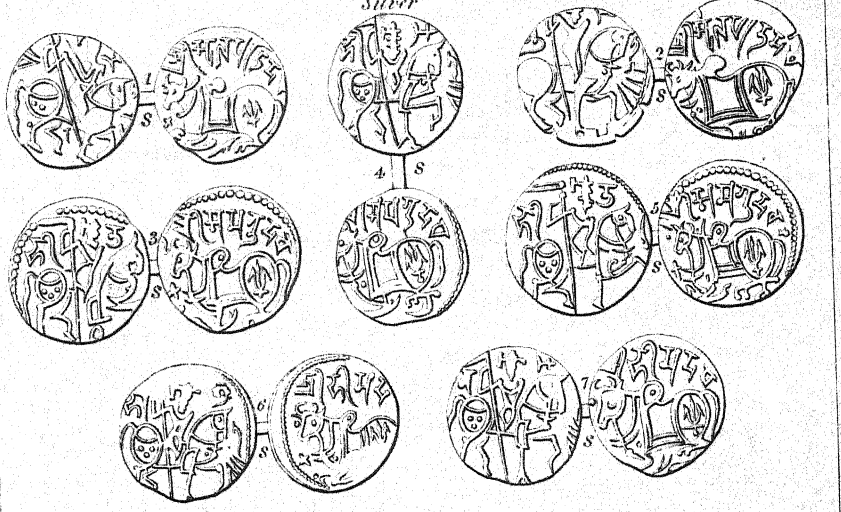
At the commencement of the foregoing essay, I alluded to this series as one of the four palpable imitations of a Grecian or Indo-Scythic model:—I had in my eye the coins of Azos and AZILISOS in particular†, which have a horseman with spear for the obverse, and a humped bull for the reverse. On being Indianized, the bull has become the *nandí* of Hindu mythology, with its ornamental *jhúl* or saddle cloth, and the trident or *tirsul* of SIVA impressed on its haunch. The horse has in like manner, received the trappings peculiar to the country, the *zèrband* and *dúmchí*. The rider has still some traces of a flowing fillet from his cap (see fig. 5,) but his dress is not otherwise open to criticism. I would not pretend to insist upon the direct filiation of the Hindu coin to what I have assumed as its prototype: but the adoption of the same elements for the device, it may be surely contended, argues some connection or descent:—it is like the preservation of armorial insignia in a family; and on these grounds, we have pre-

* SMILEY's Scripture Geography, Philadelphia, 1835, page 151.

† See Plates XXII. XXIII. of the June No., figs. 9, and 28.

Ancient Hindu Coins.

Silver

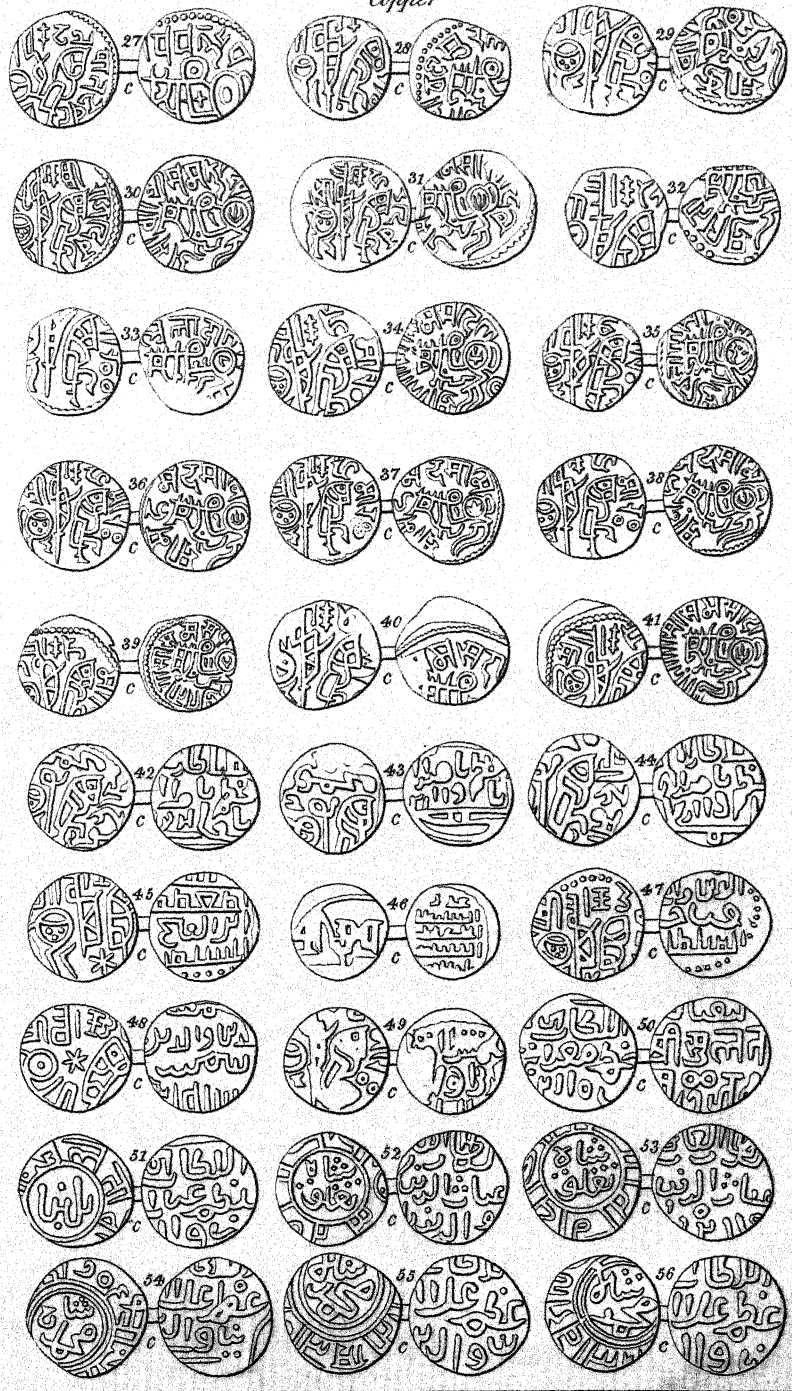


Copper

To Srirangapatam

Hindu-Muhammedan Coins.

Copper



To Wrangopathos

sumptive evidence either of the Indo-Scythic descent of the reigning dynasty,—an hypothesis borne out by the traditions of many of the Rájpút states,—or of a mere imitation of the coin of a neighbouring nation, in consequence of a poverty of native invention.

Before we proceed to canvas the epoch and country of this our third division of Hindu coins, which are matters entirely open at present, except so far that they have been called *Chohán* by Colonel TOD, and *Rájpút* by STACY, it will be convenient to take a view of all the specimens that have been collected.

The whole series may be conveniently classed under three heads; namely, 1st, such as have genuine Hindu names and the oldest form of character; for the alphabet evidently undergoes modification as we advance:—2ndly, those with Nágarí characters only, but expressive of Muhammedan names, either alone or conjointly with those of Hindu princes; and 3rdly, those retaining the equestrian device of the obverse, with also the name of the rája, but having the reverse occupied by a pure Arabic inscription.

I may premise that the average weight of the whole series of silver coins a little exceeds 50 grains, and that therefore they may be regarded as *tankas* of 3 *massas*, as was remarked of the oldest group and of the *Varáhas*.

Figs. 1, 2. These have been placed at the top of the list, because the relief in them is not confined to the mere outline. The device has already been described. There are letters on both sides of all the series, leaving us somewhat at a loss to know which side contains the rája's name, or whether the longer legend over the bull may not be merely his titles; the frequent occurrence of the *second* formula, on coins of various forms, is in favor of this view, but the actual name in the third is against it. On the present coin, the most obvious reading of the longer epigraphe is श्री स्यालपति देव *Sri Syálapati dèva*. Unfortunately the letters on the other side are cut off.

Figs. 3, 4, 5. The selection here was from 65 specimens, the collation of which left no doubt as to the context, unless in regard to the value of the fourth letter. Of the two readings suggested in my first notice of this coin श्री सामग्र देव *Sri Sámagra dèva*, or श्री सामन्त देव *Sri Sámanta dèva*, the latter is the most plausible, because SÁMANTA is a common Hindu name, a leader, captain, or champion: and although the *nta* is more like गू *gú*, in the best specimens, there are other cases, such as figs. 19 and 21, where it more nearly resembles the Bengáli न्त.

On the reverse, are the letters भी and त, on either side of the head. These are ancient forms of भो and त *bhí* and *ta*. On fig. 4,

the latter is replaced by a non-descript flourish, so that the two are probably independent of one another in the reading.

Figs. 6 and 7, the last of the silver specimens, exhibit the cognate name of श्री भीम देव, *Srí Bhíma dèva;* and on the obverse, the भी of the foregoing example.

Of the copper series, we may specify figs. 14, 15, 19½, 21, 27, and 30, as having the *Sámanta dèva* legend over the bull, with other additions, or variations of style, on account of which they have been introduced into the plates.

But first in order should be noticed the six small copper coins, figs. 8, 9, 10, 11, 12, 13 of Colonel STACY's cabinet, which are connected with the present group by the effigy of the horseman; while on the opposite we recognize the latter Canouj form of letter, and the usual termination of the coins, described in the preceding plate. A scrutiny of the whole series (some not included in the plate) has elicited the letters श्री सा म .... ल्देव; the blank may be filled up with the letters *nta, pá,* making the whole title *Srí Sámanta Pála dèva;* or if it be thought that there is not room for other letters, it may stand as *Srí Sámala dèva.*

Fig. 17. Of this curious variety we have two or three samples: the bull is omitted, and the field occupied entirely by the legend. In the engraved figure, the commencement of the second line is cut off. Colonel STACY's has a letter there, and his pandits read the whole, *Srí mam Kripa bamm bas;* but from the resemblance of the two final strokes to numerals, the appendage to the second *m,* and the analogy of the ordinary legend, I should prefer the reading श्री मन्म.. थवर्म्म देव सं १.. *Srí man m.. thavarmma dèva, Samvat* 1.., the name and the date unfortunately remaining doubtful.

Figs. 21 and 30, are duplicates: one completing the missing portion of the other impression; but owing to the strange form of two or three letters, some doubt remains as to the correct reading. On the obverse, we find आदक राज देव *A'prichha Rája dèva,* and on the reverse श्री समन्त देव *Srí Samanta dèva,* with the addition of असावरी *Asávari;* the last syllables, वरी, might almost be read मी *mi* or वग *vaga.*

Fig. 27, with the *Srí Sámanta dèva* very much perverted on the bull side, has a new name on the right of the horseman, श्री दनपाल देव *Srí Dana* (or *data*) *Pála dèva.*

Fig. 28, has an unintelligible name on the bull side: the letters visible are .. श्री वदासुर ...., .. *Srí Vadá sura..*

In fig. 29, the outline of the sacred bull is somewhat difficult to be traced. The name below it begins with the letters श्री कु पा.. *Srí kupá,* or सा कुषा *Sá kusha..*

Fig. 31, bears on the obverse the name of श्री हर देव *Srí Hara dèva.* The reverse seems to begin with the same letters as fig. 30, viz. च सा *Asá;* after which follow at a short interval, .. मसाण देव.. *Masána dèva.*

It may be hereafter found that some of the above belong to what may be called the transition period, when attempts were made to express Musalmáni names and titles in the vernacular character of India, of which I will now endeavour to produce such instances as Colonel STACY's rich collection offers.

The name of the Rája on the obverse of all the transition or *link* coins is श्री हमीरः *Srí Hamiras;* this important and well-known name may be found, either in full or in part, on figs. 20, (in this the engraver has reversed the whole die,) 22, 36, 37, 38, 39, and 40. The same name also occurs on figs. 44, 47, and 49, with an Arabic accompaniment, as will be presently noticed.

The first example of a Moslem title in its simplest form occurs in figs. 32 and 35, in the Nágarí word सुरिताण *Suritán;* this has no meaning in Hindi, and I conjecture that it is intended for the Arabic title, *Sultán:* the remainder of the sentence is in these two instances wanting.

Figs. 34, 39, 40, and 41. In these four we find a more complete paraphrase of the far sounding titles of the Delhi sovereigns; at least I conjecture that सुरिताणसा समसदीण (or as in 34, देण) is nothing more than *Sultán Sháh Shamsh ud-dín.*

Figs. 36, 37, and 38, are equally capable, and only capable, of an interpretation on the same principle: the Devanágarí letters on the reverse run thus: सामहमद सामे *Sá Mahamada Sámè*, which I would convert into *Sháh Muhammed Sámè.* The initial word will admit of being read *Srí;* but the rest of the legend is quite clear and satisfactory.

The name of *Hamíra,* as before stated, is repeated on the obverse of all these curious coins. We have now to trace it into a field one step farther removed from the primitive standard.

Figs. 48 and 49. In these, the first of the succeeding group in point of date, the horse and his rider, are transformed into singular symbols, which only our prior acquaintance with the original could enable us to decypher: the word श्री on the first, and the termination of *Hamirah* मीर on the other, are still discernible in their usual position. On the reverse, the characteristic style of the Afghán coinage is adopted, and the Arabic version, were it completely visible, would evidently be السلطان شمش الد نیا والد ین التمش *Ul Sultán Shems ul-dunya va ul-din Altamsh.* The reading commences from below.

Figs. 42 and 44, again exhibit to the right of the horse's head, the name of श्री हमीरः *Srí Hamiras,* as usual. On fig. 43, it escapes detec-

tion only by want of room on the field. In all three, the hieroglyphic which has hitherto passed for the helmeted head of the horseman, has been either designedly or unintentionally removed, and the Arabic word محمود *Mahmúd* substituted. On the other face, the full titles of this sovereign, who was the son of *Altamsh*, may be recognized without much trouble, thus: السلطان الا *Ul Sultán ul A-*
عظم ناصر الد *ázem Násir ul du-*
نیا والدین *nya va ul dín.*

the inscription terminating in the "*Mahmúd*" of the opposite face.

Fig. 25, of the preceding plate, is another coin of the same name and nature.

Fig. 47. On this variety of the *Hamíra* group, the Arabic titles are apparently السلطان فتاح الدنیا والدین *Ul Sultán Fatáh ul-dunya va ul-dín.* I only perceive one specimen of this reading in Col. STACY'S collection.

Fig. 45. The next variety of the mixed impression retains the horseman with the Hindu name, but the Arabic titles are now السلطان ابو الفتح المعظم *Ul Sultán Abu ul fateh ul Moazzem.* .....

Fig. 24, is the last on the list, exhibiting the semblance of a horseman. The small portion of the Arabic legend, included on the reverse, is fortunately sufficient to point out the owner, and enable us to complete it السلطان الا عظم علا الد نیا والدین *Ul Sultán ul ázem Ala ul dunya va ul dín,* (*Muhammed Sháh.*)

Figs. 23 and 46. There still remains undescribed a curious variety of the "bull and horseman" coin, in which the bull side is retained with the *Srí Samanta dèva;* while, contrary to usage, the horse is omitted, or replaced by an Arabic legend in the connected or flowing character. The whole purport of it is not well ascertained, but the legible portion of the two middle lines is thus read by some السلطان السطان الاعظم عدل *Ul Sultán ul ázem, ul Sultán Adil.*. Others find in it the name of *Subactegín;* and I am inclined to adjudge it rather to an earlier period than the *Ghórí* dynasty, both from the Arabic style, and from the retention of the name of *Sámanta dèva* on the reverse.

Figs. 26 and 50. We now pass to a new form of coin, allied to the foregoing, indeed, by the retention of Hindí on one side, but differing from them in the total rejection of the pictorial emblems. That the proper orthography of the word *Sultán* was now attained is evident in the initial letters श्री सुलता.. *Srí Sultá*.. The lower line presents three letters मव्वज *mavvaj*, which may be intended for *moazz*, thus agreeing with the Arabic of the opposite face الاعظم معز الدنیا والد ین لسلطان *Ul Sultán ul ázem moaz ul dunya va ul dín* (either *Bairam*

Sháh, 1239, or *Kai Kobad*, 1286?) the only two emperors which bore the appellation of *Moaz ul-dín*.

From the last coin, the passage is easy to those of purely Muhammedan aspect, such as are described in MARSDEN's *Numismata*, vol. ii.; but this author does not appear to have had an opportunity of examining an intermediate group of coins, on which, in deference to the conquered people, a Nágarí inscription was retained on the margin.

They are by no means uncommon; yet it is rare to find the marginal legend perfect. MARSDEN's DCCXIII., of *Toghlak Sháh*, is of this species; but in it the Nágarí falls beyond the limits of the disc.

I have therefore thought that a few examples of this group might form a proper appendage to the present series, and have accordingly introduced three varieties from Colonel STACY's and my own collections, to fill up the plate.

Fig. 51, the earliest in date, must be read from the reverse السلطان الاعظم غياث الدنيا والدين بلبن *Ul Sultán ul áăzem Ghiás ul dunya va ul-dín*, (and in the centre of the obverse,) *Balban*; the latter is encircled by a Nágarí sentence, of which श्री सुलताण.. is visible.

Figs. 54, 55, and 56, are coins of the celebrated ALAUDDIN*, the disposition of the titles and name as before السلطان علاء الدنيا والدين محمد شاه *Ul Sultán Ala ul dunya va ul-dín Muhammed Sháh*. On the margin, श्री सुलतानश ७०६ *Srí Sultán Sháh*, (A. H.) 706.

Figs. 52 and 53, close our present series; they bear the titular designations of TOGHLAK SH'AH, السلطان الاعظم غياث الدنيا والدين تغلق شاه *Ul Sultán ul áăzem Ghiás ul dunya va ul-dín, Toghlak Sháh*. The Nágarí of the margin is similar to the last, but imperfect, as if cut by one ignorant of the language.

After the complete and satisfactory evidence we have just examined, little need be said as to the epoch to which at least the mixed or Hindu-Muhammedan portion of the bull and horseman group belongs: for, from the names inscribed in Nágarí or Arabic, or from the titles or cognomina, which are in fact as frequently the names by which the Musalmán sovereigns are known, we can nearly fill up the first century of the Patán monarchs of Delhi, thus:

Srí Muhammed Sáme is, I presume, MUHAMMED BIN SÁMUL GHORI, the first of the dynasty, commonly known by his cognomen *Shahábul-din*, who possessed himself of the throne of Delhi, A. H. 588, A. D. 1192.

Shamsh ul-din, in Nágarí and Arabic, is *Altamsh*,	A. H.	607	A. D. 1210
Moaz ul-din, must be BAIRAM SHÁH, his son,		637	1239

* At the time of engraving the plate, I mistook the MUHAMMED SHA'H for the son of TOGHLAK: the date corrects me.

Alá ul-din, may be MASAUD, the son of FIROZ,	A. H. 640	A. D. 1242
Násir ul-dín, denotes MAHMUD, son of ALTAMSH,	643	1245
Ghias ul-din, BALBAN, has the full name also,	664	1265
Alá ul-din, MUHAMMED SHÁH, bears its own date,	695	1295
Ghiás ul-din, TOGHLAK SHÁH, cannot be mistaken,	721	1321

It is not from these names, however, but rather from the Hindu ones, that we must seek to fix the *locality* of the *bull* and *horseman* insignia, and the readiest mode of arriving at the truth is to proceed backwards, the best chance of verifying the names of Rájas being through their preservation, even in a corrupt form, in the pages of Moslem history. HAMIRAS, the name common to so many of the series, is admirably adapted for our purpose. He can be no other than the HAMIR* of the *Mewár* chronicles, who, born and nurtured in the forests of *Ondwa*, was destined to revive the glory of *Chitór*, even after it had succumbed to two successive assaults under the unsparing ALLA. We find it recorded in FERISHTÁ's history, (A. D. 1304,) that "at length finding it of no use to retain *Chitór*, the king ordered the Prince KHIZR KHÁN to evacuate it, and to make it over to the nephew of the Rája. This Hindu Prince, in a short time, restored the principality to its former condition, and retained the tract of *Chitór* as tributary to ALLA-UD-DIN, during the rest of his reign†." According to TOD‡, "HAMIR succeeded to the throne in Samvat 1357, (A. D. 1300,) and had sixty-four years to redeem his country from the ruins of the past century, which period had elapsed since India ceased to own the paramount sway of her native princes." These 64 years would include nearly the whole reign of ALLA I., and that of his successors OMAR, MUBÁRIK, KHOSRU, TOGHLAK, his son MUHAMMED, and FIROZ. On the coins themselves, we have found the obverse of HAMIRA coupled with the stamp of *Mahamad Sámè*, *Shams ul-dín*, *Alla ul-dín*, *Násir ul-dín*, and *Fatáh ul-dín*; three of whom are clearly anterior to the reign of ALA-UD-DIN; as ALTAMSH alone bore the cognomen of *Shamsh ul-dín*; his son that of *Násir ul-dín*; and MAHAMMED GHORÍ that of *Sámè*. We might indeed read the latter word *Sání*, and so apply it and the title of *Násir ul-dín* to MUHAMMED II. the son of TOGHLAK, whose cognomen is not recorded. But still *Shamsh ul-dín* remains unexplained, and the apparent anachronism cannot be accounted for. It should be noted that the name of HAMIR is not mentioned in FERISHTA; but only the "nephew of the Rája Ratan Sinh." The cognomen *Fatáh ul-dín* is not to be found in the whole line of the *Patán* Sultáns.

* *Humberdew* of BRIGG's Ferishta, *Amir deo* of Dow, when speaking of the siege of Rintimpore: he is not mentioned afterwards by name, nor as of *Mewár*.

† BRIGG's Ferishta, i. 363. ‡ Rájasthán, i. 269.

Mewár had been in subjection to the Delhi monarchs since the invasions of MUHAMMED GHORI; ALTAMSH also invaded it in 1210: hence there can be the less doubt that the barbarized names, *Srí Mahamad Sáme* and *Srí Samasoden*, on the indigenous coinage applied to these two sovereigns, notwithstanding the difficulty above alluded to.

The fortunate preservation of HAMIRA's name, in conjunction with those of his allies, upon these coins, proves at any rate the identical place of their coinage, and fixes it at *Chitór*, the seat of the dynasty founded by BAPPA, in A. D. 727, after the destruction of the *Balhára* monarchy of *Saurásh'tra*. This information also limits our search for the names previous to *Hamíra*, to the descendants of BAPPA RÁWEL, of whom two or three genealogical lists have been preserved in various inscriptions, some decyphered and explained by Mr. WILSON, in the *As. Researches*, vol. XV., and others by Colonel TOD. The latter authority enjoyed the advantage of filling up the history of *Mewár* from the national poems and traditions of the place; but it must be confessed, as strangely perplexing, that the names of the immediate predecessors of HAMIRA should be at total variance in the Hindu and the Muhammedan accounts. Thus, FERISHTA makes RAY RATAN SE'N the Rája of *Chitór*, who was taken prisoner at the sack of the fort, and who escaped through a romantic stratagem of his daughter, and continued to ravage the country until his nephew was installed as above stated in the masnad. Colonel TOD makes the name of the imprisoned Rája, BHÍMSI, and that of his daughter, PADMANÍ. The circumstances which led to the admission of the fair heroine into the hostile camp with her 700 litters, each freighted like the Trojan horse, are also differently related by the two authors. It will be a strong motive for the preference of the Hindu account, if the BHIMA DE'VA of our coins can be identified with this BHÍMSI (*Bhima sinha*): but the short interval from his return to *Chitór* to the death of himself and his family in the sack which followed, would hardly allow the issue of a regular coinage in his name at such a turbulent period. The style also of the Nágarí alphabet (the भ *bh* especially) differs materially from that of HAMIRA's name. Yet there is no other *Bhíma* in the *Mewár* list. FERISHTA mentions one (*Bhím-dew*) as the brother of SHUNKUL DEW, the Prince of *Deogir*, contemporaneous with ALLA; but he does not seem to have attained the throne. In the collateral line of the *Gujerát* Rájas, the same name occurs thrice, the last in 1209, of whom the Moslem histories make frequent mention; but the insignia of this *Ráj* are of a distinct character, and will not admit of our transferring the bull and horseman device thither for an owner*.

* BHIMA DE'VA of *Gujerát* was defeated by MUHAMMED GHÓRI' (or *Sámè?*) in A. D. 1178.

It provokingly happens that the nine rájas immediately preceding Bhímsi, in Tod's list, are omitted as an uninteresting string of names; thus shutting out a chance of recognizing many of the petty names of our coin list. We must in consequence pass over *Dánapála dèva, Kripá, Vadásur*, &c. and retrograde to *Sámanta dèva*. This name is one of those on the inscriptions from mount *Abu (Arbuda)**, the 18th of the *Guhila* family, to whom an actual date is also assigned, namely A. D. 1209. The objection to this is, like that to *Bhima*, that the date is too modern for the alphabetical type; moreover, from Tod we learn, that it was Rahup of *Mewár* who was attacked by Shemsh ul-dín *(Altamsh)*, in 1210-20, and this name we have recognized in the more modern Nágarí on several of the horseman coins.

There are other *Sámanta (Sinha) dèvas* in the *Anhulwára* line of *Gujerát* of an earlier period, both in the *Ayin Akberí*, and in the native chronicles; indeed, Banarája himself, the founder of the *Chohán* race at *Anhulpur*, was the son of a Sámanta Sinha, fixed by Tod in A. D. 745: and it is worthy of particular note, that the first prince restored to the *Gujerát* throne, near two centuries after the overthrow of the Balháras by the Parthians, is called in the *Ayin Akberí*, "Saila de'va, who was previously living in retirement at *Ujjain* in A. D. 696." Now the name on the coin which I have assumed as the most ancient of the series, and therefore placed at the top of Plate XVI., is Syalapati de'va, a name apparently taken from the country where he ruled†; but which might easily be converted, either with or without intention, into S'aila de'va, a title denoting dominion or birth among the mountains.

In conclusion, it should be borne in mind, that both the *Mewár* and the *Gujerat* lines are of one family, that of the *Gehlote* or *Sesodia* tribe, to which, though arrogating to itself a descent from the Sun, the Persian historians uniformly ascribe a *Parthian* origin. May not this be received as a good foundation for the Indo-Scythic device on their coinage; or on the other hand does not the latter fact, supported by historical tradition, go far towards the corroboration of the extra Indian origin of the *Mewár* dynasty?

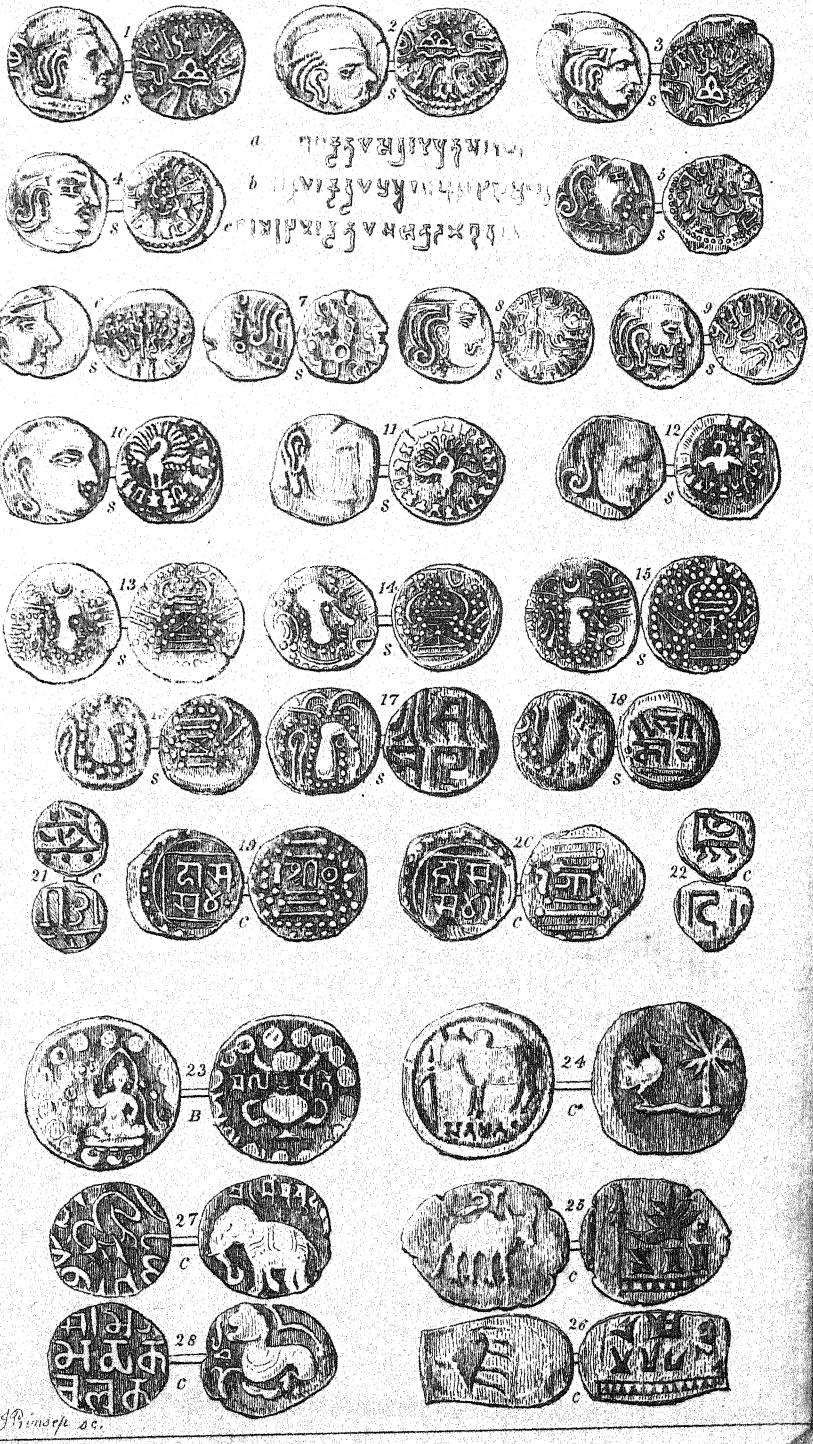
Plate XLIX. Saurashtra Coins.

In antiquity the present series doubtless should take precedence of those depicted in the three last plates; perhaps it should rank next to the *Behat* or *Buddhist* group, for it has an important symbol in common with them. My only reason for delaying to notice it until the last, has been the hopes of receiving a further accession of

* As. Res. vol. xvi. page 322.

† *Syalakoth*, the fort of Syála near the Indus, was once attacked by the armies of *Mewár*.

Hindu Coins – Saurashtra Series.



J. Prinsep sc.

The Bridgeport Public Library

specimens from Lieutenant BURNES, who lately forwarded me several coins, and afterwards wrote me that he had come on a further treasure of them in the course of some excavations in Cutch.

A few specimens of the new accessions, selected by Mr. WATHEN at Bombay, did not add much to the variety with which I had already become acquainted from the collections of KERÁMAT ALI and MOHAN LÁL, of Lieutenant CONOLLY, and especially of Colonel STACY. Some of these I have before made known: other varieties have been long since published in Colonel TOD's plate of coins in the Transactions of the Royal Asiatic Society, but there are many entirely new in the plate I am now about to introduce to my readers.

In the first place, however, I am pledged to prove that the type of this series of Indian coins is a fourth example of imitation of a Grecian original. The very style and beauty of the profile on some of the earlier specimens, (figs. 1, 3, 10,) might be enough to convince an artist or a sculptor of the fact, for we might in vain seek such accurate delineations of the human features on any genuine Hindu coin; witness the degradation to which the very same device soon arrives under its Hindu adoption. But a comparison with the coins of the *Arsakian* and *Sassanian* dynasties of Persia, which are confessedly of Greek origin, may go farther to satisfy a sceptic on this point. The mode of dressing the hair belongs exclusively to Parthia: none of the genuine Bactrians even have it, and in the whole of our Indo-Scythic acquaintance, it will only be seen on the medals of KONOS, engraved as figs. 11, 12, and 13, of Plate XXV. of the present volume. In him the likeness is perfect, and him, therefore, I would deem the progenitor of this *Saurâshtra* group, so similar in size, weight, metal, and contour of the head. The marked distinction between the two is confined to the reverse. Here a long Devanágarí inscription, encircling a curious monogram, is substituted for the standing figure with his hitherto uninterpreted motto, MAKAP.... PAHCPOT.

Apropos of this seemingly impossible Greek combination; even while I am writing this passage, the explanation starts to my imagination, like an enigma or puzzle laid aside for an interval, and taken up by chance in a position in which its solution strikes palpably on the eye, and the wonder arises how it could have escaped detection at the first! It may be remembered, that in describing the various mottos on the reverses of the Kanerki and Kadphises group, in my last notice, I remarked a curious instance of the word OKPO "the sun," being changed into APΔOKPO, "the great sun*."

* Mr. V. TREGEAR writes tome, that he has just met with a duplicate of the gold APΔOKPO coin, plate L., fig. 6. It was stated to have been dug up by a pea-

Now AΘPO was also one of the original simple denominations of the same class, supposed to be of a like import with *Mithra*, or the sun. By the rule of mutations, the addition of APΔA or APTA, great, would lengthen the initial vowel of this word, or change it into an H, and produce the compound form APΔHΘPO, "the great *Athra*." Giving a Greek termination and putting it, as usual, in the genitive case, we shall have MAKAPOΣ APΔHΘPOY, "of the blessed *ard-Athra*." This is the very expression existing on the coin, supplying only a single letter, A, which is cut off through the imperfection of the die. Hear we have a happy illustration as well of the connection between the several groups and their respective objects of worship, as of the gradual and necessary development which these interesting researches are calculated to produce. Further, on conversing, this moment, with a pandit from the *Panjáb*, I learn that the sun is called in the *Pushtu* language, *Ait*, आएत, or *Ayat* आयत; a corruption, he says from the pure Sanscrit आदित्य *Aditya*, whence may be derived in a similar manner *Ait-wár* or *etwár*, the common *Hinduí* expression for Sunday. To all of these forms, the similarity of the Zend word *Athro* is obvious, and we need therefore seek no refined subtlety in admitting it to worship as the etherial essence of the sun, since it can with so much more simplicity be understood as a common denomination of the solar orb itself. It should be remarked, that the effigy of APΔHΘPO, like that of AΘPO, has flames on his shoulders.

I will not stop to inquire whether the change from the Sanscrit OKPO *(Arka)* to the *Pushto* or *Zend* AΘPO (*Aita*) has any possible connection with a parallel charge in the family designation of the *Saurásh*tra princes, who were in the first centuries of the Christian era marked by the affix *Bhatárka*, (cherished by *Arka*,) but afterwards, for a long succession of reigns, were known by the surname of *A'ditya*; but will proceed to describe the immediate contents of the plate now under review.

Figs. 1, 2, 3, are placed at the head of the series, because in them the head bears the nearest analogy to its prototype. In fig. 1, indeed, the letters behind the head may be almost conceived to belong to KωΔOY. In the centre of the reverse is the so called *chaitya* symbol ⛲: which, had it only occurred on these descendants of a Mithraic coin, I should now be inclined to designate a symbol of the holy flame,

sant in the Juanpur district, along with 50 others, which were immediately committed to the melting pot. I may here take occasion to notice, that the pilgrim who sold the three coins of KADPHISES in the bazar of Benares was not a *Marhatta*, but a native of the *Panjáb*.

trilingual and pyramidal, of the Sassanian fire-worship. The marginal writing may with certainty be pronounced to be an ancient form of Sanscrit; but I cannot attempt to read it. In figures *a*, *b*, *c*, I have copied the lines from three other coins, and have thus ascertained that a portion of the legend is the same in all, while the remainder varies. The former doubtless comprehends the regal titles; but in it there is no approach to the ordinary Indian terms of Rája, Rao, &c. The six parallel letters may be read परक्षतपस.

Figs. 4 and 5, differ from the preceding in the central device, which now bears a rude resemblance to the human figure. The letters and general execution are very imperfect.

Figs. 6 to 9, are one step further removed from perfection. The legend where best preserved, as in fig. 9, appears a mere repetition of the letter *p*, with the suffix *r*, *ri*, and *y*. There are three letters behind the head in fig. 7, which may be taken either for corrupted Greek, or for the Pehlevi of the Sassanian coins, ⊔⊔⊔. The central symbol has the form of a trident. Lieut. Burnes informs me that several hundred of these three species of coins were found in Cutch in 1830 in a copper vessel buried in the ruins of *Puragarh*, 20 miles west of Bhoj, a place of great antiquity, and yet marked by the ruins of a palace and a mint.

Figs. 10, 11, 12, are of a different type, though nearly allied to the former; they are not only found in *Gajerát*, but at *Kanouj*, *Ujjain*, and generally in Upper India. Lieut. Cunningham has just sent me impressions of five very well-preserved specimens procured at Benares, on which in front of the face are seen some letters very like the Pehlevi character, ∝∠∽. The Sanscrit too is not of the elongated form of the upper group, but exactly like that of Mr. Wathen's *Gujerát* inscriptions. Not having yet succeeded in decyphering them, it is needless to copy out the mere letters at present. The symbol in the centre will be recognized as the peacock, sacred to *Kumára*, the Mars of the Rájputs, alluded to in the preceding observations.

Figs. 13, 14, 15. The popular name for these rude coins, of silver and of copper, is, according to Lieut. Burnes, in *Gujerát*, "*Gadhia ká paisa*," *Ass* money, or rather, "the money of *Gadhia*," a name of Vikramáditya, whose father Jayanta, one of the *Gandharbas*, or heavenly choristers, is reputed to have been cursed by Indra, and converted into an ass. Wilford, in his Essay on the *Era of Vikramáditya*, endeavours to trace, in this story, the Persian fable of Bahramgôr's amours with an Indian Princess, whence were descended the *Gardabhina* dynasty of Western India, (*gardabha*, being, in Sanscrit,

equivalent to *gór**, an ass.) The story is admitted into the prophetic chapters of the *Agni Purána*, and is supported by traditions all over the country. Remains of the palace of this VIKRAMA are shewn in *Gujerát*, in *Ujjain*, and even at *Benares !* the Hindus insist that this VIKRAMA was not a paramount sovereign of India but only a powerful king of the western provinces, his capital being *Cambát* or *Cambay :* and it is certain that the princes of those parts were tributary to Persia from a very early period. The veteran antiquarian, Colonel WILFORD, would have been delighted, could he have witnessed the confirmation of his theories afforded by the coins before us, borne out by the local tradition of a people now unable even to guess at the nature of the curious and barbarous marks on them. None but a professed studier of coins could possibly have discovered on them the profile of a face, after the Persian model, on one side, and the actual *Sassanian fire-altar* on the other; yet such is indubitably the case, as an attentive consideration of the accumulation of lines and dots on figs. 13, 16, will prove. The distortion of the face has proceeded from an undue relief being given by the die-cutter to the forehead and cheek : and this has by degrees apparently deceived the engraver himself, who at last contents himself with a deeply projecting oblong button, encircled by dots, (figs. 16—18) ! Should this fire-altar be admitted as proof of an Indo-Sassanian dynasty in *Saurásh̄tra*, we may find the date of its establishment in the epoch of YESDIJIRD, the son of BAHRAMGOR ; supported by the concurrent testimony of the *Agni Purána*, that VIKRAMA, the son of GADHÁRUPA, should ascend the throne of *Málavá* (*Ujjain*) 753 years after the expiation of CHÁNAKYA, or A. D. 441.

Fig. 17, is one of several very curious coins in Colonel STACY's cabinet. The obverse shews it to be a direct descendant of 15 or 16, the "*Chouka-dúka*" of Colonel STACY ; while the Nágarí inscription of the reverse is at once perceived to agree with the second, or *Gaur*, series of the *Kanouj* coins. I adverted to this fact before, and stated that it seemed to point to the paramount influence of the PÁLA family of *Kanouj* from *Gaur* in Bengal to *Gujerát*†. The inscription has the letters श्री स.... लदेव probably *Srí Sámanta* or *Sámara Pála dèva.*

Fig. 18, is a more modern variety of the *Chouka-dúka*, on which the fire altar is replaced by Nágarí letters of the eleventh or twelfth century. The reading appears श्री कौज *Srí Kanja ?* but it is more probably श्री काल *Srí Kála*, for we find a KÁLA DE'VA in the *Gujerát* list towards the close of the 11th century, whom WILFORD would identify with VISALA DE'VA of Delhi.

Figs. 19, 20. I have placed these two novelties from Colonel

* As. Res. ix. 155. † See observations in page 682.

STACY's cabinet, in juxtaposition with the *Saurâshtra* group, because we see in them the evident remains of the fire-altar device of figs. 13, 15. The body of the altar only is removed and replaced by the Sanscrit श्री *Srí*; the opposite face has the very legible letters ह्रासस ४० and ४१ *Hásas*, 40 or 41. The explanation of ह्रासस् in WILSON's Dictionary is "the moon (in the language of the *védas*;)" but it would be hazardous to interpret *Srí Hásas*, as indicative of a lunar worship, or an adoption of a lunar motto, in contrast with the solar effigy and the fire emblems that preceded it. श्री *Srí*, by itself, is still impressed upon the *Shâh-Alem* coin of *Málwá*, which is denominated from this circumstance the *Srí-sáhy* rupee*. It is an epithet of the goddess LAXMI', and denotes pure Hinduism in the reigning dynasty.

Hás, taken separately, may be a contraction of *Hástinapur*, or *Hánsí*, the place of coinage, and स ४० may be *Samvat* 40 or 41, the year of reign.

Figs. 21 and 22, should rather have found a place among the *Pála* coins of *Kanouj*; for on the reverse of both, sufficient of the *Gaur* alphabetic characters are seen to enable us to fill up the whole reading as श्री अजय देव *Srí Ajaya dèva*. The obverse seems to be a rude outline of a horse or a bull.

At the foot of this plate I have inserted a few miscellaneous coins, which I was doubtful where to place with propriety, or which have reached me since the foregoing plates went to press.

Fig. 23, is in Colonel STACY's collection, a brass coin of unique appearance; on the obverse, a seated figure, adorned with a glory; on the reverse, an urn containing flowers, and across the field, in the ancient form of Sanscrit 𑀯𑀕𑀼𑀧𑀢𑀺 *Vagupati*; around the margin, on both sides, is a garland of roses.

Fig. 24, is a recent accession to Colonel STACY's collection: on one side a bull and staff, with the unknown word 𑀯𑀳𑀘𑀳; on the other side, the peacock of *Kumára* and a palm tree? This coin is evidently allied to those found by Mr. SPIERS, in the Allahabad district, and figured in Plate XXVI. of vol. iii.; two of them are here re-engraved as being more in place. Lieut. CUNNINGHAM has a duplicate of 25, with a fuller inscription in the Allahabad form of Nágarí; I shall take a future opportunity of engraving it.

Fig. 27, is a copper coin found in the parcel lately received from Syed KERÁMAT ALI'. It is remarkable for containing the motto of the Rajpút series श्री समय देव *Sri Samagri (or Samanta) dèva*, with an elephant instead of a bull; while on the reverse, the rude outline of a horse without rider seems encircled by a Pehlevi legend; a coin

* See Useful Tables, Part I.

nearly similar was engraved in the plate of Lieutenant BURNES' coins, Plate XI., fig 17, page 318 of vol. ii.

Fig. 28, from the same source as the last, is also nearly a duplicate of fig. 14, of the above plate, except that it has the *sinha*, a lion, for reverse, instead of the horse; the letters correspond exactly, but though individually distinct enough, I can make nothing of the context.

With these I close my present notice, not I fear before I have tired out many of my readers! and it is with some compunctious feelings towards all but the few whose zeal in the cause of Indian numismatology equals or surpasses my own, that I announce my having received fresh materials, from various quarters, wherewith to revive the subject in the ensuing year. Mr. MASSON's second memoir must also find a place in the January number. On some future occasion I hope to be able to strike off a fresh edition of the coin plates, and to gather all that has been written on the subject, into a distinct volume, when the train of discovery shall begin to relax, and the materials scattered through the pages of the journal may be supposed to comprise most of the varieties of the ancient coins of India*.

IV.—*Geological Observations made in a journey from Mussooree (Masúrí) to Gungotree (Gangautrí). By the Rev.* R. EVEREST.

Mussooree is situated upon the outermost ridge of the Himálaya mountains, which these ranges is made from N. W. to S. E. nearly, and presents a bold escarpment towards the valley of *Dehra*, or the *Dún*, above which it rises to the height of nearly 4000 feet.

This ridge consists of beds of compact limestone alternating with others of a soft slate with an earthy fracture, and exhibits certain characteristics, both in its mineral structure and in its general outlines, analogous to the transition limestone of the north of Europe, and the mountain limestone of England. Its most general colour is bluish black, and from this it passes through grey to greyish white, and again, on the other side to perfect black, not differing there from the lucullite, or compact black marble (as it is called). It is carboniferous: it is highly cavernous. Many varieties emit a fœtid smell, probably of sulphuretted and carburetted hydrogen: indeed where the rock is quarried, the smell is similar to that at the mouth

* I issue with the present number a continuation of the Appendix of "Useful Tables," containing Genealogical Tables of the principal Hindu dynasties, which will assist the reader very much in understanding the allocation of the various series of coins described above: the tables were formed principally with this view.

of a coal-pit. These carboniferous or coaly varieties have, however, one peculiarity. They are in some places highly vesicular, so much so as to resemble a grey lava; and in this state appear to have partially suffered from the action of heat. Mr. FISHER, in his account of the Mussooree limestone, (see GLEANINGS for May, 1832, p. 194) states that it is "highly crystallized," but I did not meet with any such rock during my stay in the neighbourhood, nor see any specimens of it.

The slate that alternates with the limestone is of various colours, bluish black, grey, greenish grey, brownish red, purplish, and yellow. It is generally soft, and crumbling, and will not split into large plates: but about two miles west of the station, below the peak called *Háti-paon* and nearly half way down the hill, a bluish black variety is found, hard enough to be used as a roofing-slate. Somewhat to the west of this, on the *Dudhillee* hill (a station of the Trigonometrical Survey), a trap rock makes its appearance. It is to be met with at the bottom of a small water-course, and may be traced for about half a mile in a direction nearly parallel to the range of the mountains. It is composed in some parts principally of compact white felspar and green diallage, in others principally of hornblende. It was not possible to trace the manner of its connection with the adjacent strata, which are evidently much disturbed, though they had not suffered any change in mineral character by contact with it. Probably it has cut through them as a dyke, and the continuation of it may again be met with about a mile to the eastward, where a black heavy trap is to be seen, containing crystals of bronzite imbedded. The general range of these alternating beds of slate and limestone appears to be nearly parallel to that of the direction of the mountains, but not exactly so, as it approaches somewhat more to a north and south line, the dip being a little to the northward of the east, and the angle of it from 20° to 30°. The slopes are very steep, usually covered with a luxuriant vegetation, and remind us of those in Cumberland and Derbyshire, though, of course, on a much larger scale. In the Mussooree rock, however, there is a great deficiency of mineral veins. As we travelled eastwards from Mussooree to Landour, we found, a short distance beyond the hospital, quartzy-sandstone, of a white and greyish colour lying upon the soft, earthy slate. This appearance continued four miles further on to Soakolly, the quartzy-sandstone capping the peaks, and the slate underlying it. From Soakolly we descended for several miles, in a N. N. E. direction, over alternating beds of quartzy-sandstone and slate, to the Agilwar river, which runs with a westerly course to the Jumna. The slate,

which alternates with the quartzy-sandstone, often becomes a distinct grey-wacke, consisting of a greyish green base, with numerous angular fragments of clay-slate imbedded. No such appearances could be observed in the slates which alternate with the Mussooree limestone, and this circumstance, coupled with that of superposition, seems to mark the quartzy-sandstone as the newest formation of the two.

To the north of the Agilwar, we passed over one more ridge of apparently similar composition to the one just described, and then descended into the valley of the Ganges. This valley, where we came upon it, is full a mile broad, and exhibits at different heights, say from 2 to 300 feet above the present level of the stream, flat terraces of gravel, containing boulders, from the size of a pumpkin downwards, perfectly similar to what form the present bed of the river. These appearances continue all the way to its source. In the bed of the river and the precipitous banks that enclose it, we found strata of blue slate, hard and splitting into large plates, uniform in colour and general character, and inclined at a considerable angle to the N. E.—a slate widely different from the soft and parti-coloured varieties, that alternate with the limestone of Mussooree. As we advanced northwards, where our road led us to a considerable height above the river, we met again with a limestone and slate similar to that at Mussooree, and the overlying quartzy-sandstone, apparently capping all the heights in the neighbourhood. At the end of our second day's march along the course of the river, the quartzy-sandstone had become the predominant rock, and the slate had nearly disappeared, being only found in the lowest ground opposite Ballahaut. The line of junction of the two was seen only a few feet above the level of the river. Somewhat before this, the slate had partly assumed the character of talc-slate, having a faint glimmering lustre, and a soapy feel. Beyond Ballahaut we continued travelling near the line of junction of the two formations, the slate gradually passing into a perfect talc-slate, and the quartzy-sandstone becoming rather more crystalline than before. Perhaps the name of quartz rock might be more appropriate to it, though it still exhibits in some places traces of round grains agglutinated together. About Batwaree, two marches in advance of Ballahaut, the quartzy-sandstone ceases on the low ground and the slate contains a mixture of quartzy and felspar, forming a talcose gneiss, with hornblende occasionally intermixed. Traces of the quartzy-sandstone yet remain upon the cliffs above for some miles farther to the north, where a gradual passage of it may be observed into the talcose gneiss. We found this talcose gneiss for two marches further to the north, containing, however, at times a

good deal of mica, and, rarely, garnets. The valley in which the river flowed had become narrower day by day, and was now nothing but a channel of the breadth of the water course, from which cliffs nearly perpendicular rose, on either side, to the height of several thousand feet, shewing a section of the different beds from the top to the bottom. The rock was evidently approximating to a real gneiss, but it was not until the third day's march from Butwaree, between Daugal Dhurmsála and the village of Sookee, that a gneiss and mica slate formation appeared in its usual features of grandeur, and with its usually-accompanying minerals. Here the river flows in a cut through a ridge, which to the west forms the snowy peaks from which the Jumna takes its rise, and continuing to the east, always above the line of forest, and often far above that of perpetual snow, runs to the south of the temple at Gungotree. Bare precipices, thousands of feet in height, and pinnacles thrust into the sky—those characteristic pinnacles which in other countries have received the names of *horns*, *spids*, and *aiguilles*, and here are called by a term of similar import, *kantas*, present themselves prominently to our view—and as we climb over the ruins below, among blocks bigger than houses, by the side of which the foaming river runs, we find a well-defined gneiss and mica slate, with kyanite and garnet imbedded. A thin stratum of coarse-grained snow-white marble was also seen. On approaching the village of Sookee, white layers and veins were seen in the cliffs that overhung us. They were composed of a coarse-grained granite, containing crystals of black tourmaline imbedded. This granite is seen in the mass a short distance further on, where the river takes a sharp turn to the eastward towards Dilâree. Here the precipices on the northern bank were composed of mica slate overlaid by a rock, the rounded outlines and bare ruggedness of which indicated granite. About a mile beyond Dilâree the line of junction changes from the horizontal to the vertical. Both rocks may be traced in contact for several hundred feet upwards, but the slate does not appear to have been at all disturbed by contiguity of the granite. The dip is here, as it has been throughout the whole of our journey, between N. and E., with little or no variation. We met with granite further on, all the way to Gungotree—granite often having mica rarely, and acicular crystals of black schorl abundantly imbedded. Yet, besides the ridge of snowy "aiguilles," which runs three or four miles to the south of us, and peers everywhere above the intermediate rocks, another similar one is seen to the north of us, which meets the first at an acute angle, a short distance beyond the temple at Gungotree. Both these ridges, from their peculiar outlines, must be

of mica slate, or gneiss. We find too on our way masses of slate several feet accross lying in the granite, and pieces again of the size of a brick, as if they had been imbedded in it in a state of semifusion, so as to form an irregular gneiss. But these appearances are only partial. This granite appears to range in nearly an east and west line. We have crossed three different masses of trap on our journey, besides the diallage rock, I mentioned, to the west of Mussooree, viz. one on the ridge before descending into the valley of the Ganges, and two others in the clay-slate, and talc slate. We could not, in either case, trace their connection with the surrounding rock: but we probably crossed them at nearly a right angle, and, if so, their ranges must approach to a parallel with that of the granite. They had all the characters of a common greenstone. From Gungotree to Dilâree, the river runs through a gloomy chasm in the granite; the branch from Gungotree has rather a dingy hue, but the northern one called the Melung, that comes from Tartary, is, indeed, a beautiful water—as blue as the Rhone when it issues from the lake of Geneva. As the stream becomes larger below Sookee, it is a grand and singular object—with a body of water as great as that at the falls of Schaffhausen, perhaps much greater, it preserved the appearance of a mountain brook during the whole of the time we saw it. There is no perpendicular fall, but the slope is so great that it tumbles and foams over the rocks for the entire distance.

To recapitulate the rocks observed in the order of succession, they are—1, granite; 2, gneiss and mica slate; 3, talcose gneiss and talc-slate; 4, clay-slate; 5, Mussooree limestone; 6, quartz-rock, or rather quartzy-sandstone, and grey wacke slate.

The relative position of these two last, however, needs farther investigation, for there are undoubtedly seams of quartzy-sandstone alternating with the Mussooree formation; one in particular, several feet in thickness, may be observed near the bottom of the hill, just above the village of Râjpoor.

V.—*Note on the Fossil Camel of the Sub-Himâlayas.* *By Lieut.* W. E. Baker, *Engineers.*

With reference to a doubt expressed in your Journal for September, the specimens of "Camelidæ" now in our possession, will, I hope, be sufficient to establish the existence of that genus in the fossil state.

They are: A cranium, with portions of both rows of upper molars, shewing also the occipital and parietal bones, so peculiar in the camel.

A fragment of upper jaw with molars.

Two fragments of lower jaw with molars.

The upper and lower extremities of a metacarpal bone (the central piece wanting).

The lower extremity of a radius.

In the above specimens, I have been unable to detect any point of difference from the camel of the country, with which also they appear to correspond in size. The cranium, however, has not yet been cleared from the matrix, which *may* conceal some distinctive mark.

The existence of fossil *Capridæ*, (in which I include antelopes,) is established by numerous specimens of teeth and jaws, and several heads, more or less perfect; these, with the *Cervidæ* and *Bos*, nearly complete the *known* varieties of ruminant of the larger unknown genera: we have yet much to learn.

I have lately seen a nearly perfect fore-leg (consisting of the humerus, radius, cubitus, carpus, metacarpus, and one phalanx), of a ruminant which must have united the height of the camel with the proportions of the bos, judging from the great excess in length of radius compared with that of the humerus and metacarpal bone. Of a similar animal we possess chains of vertebræ, cervical and lumbar, at present buried in matrix; should their clearance determine any interesting point, I shall not fail to communicate it.

Of rhinoceros remains, we have now a plentiful and most interesting collection, comprising, besides teeth, heads, &c., more numerous perfect bones than of any other animal.

Our latest acquisitions are teeth and jaws of the porcupine and rat, several fragments of *fish* with their *scales beautifully* perfect, and a small species of felis about the size of the jungle cat.

P. S. Your fig. 19, Pl. XXXIII. vol. iv. appears to me the upper articulating surface of an axis of horse or camel, whether the former or latter might be judged by the size.

I make this guess, from the appearance of the angle with which the pivot rises out of the flat articulating surface.

In the bullock, antelopes, goat, sheep, and stag, the rise is nearly perpendicular: in the horse or camel, it has a concave shape. Fig. 19, is apparently much interwoven; the axis which I have supposed may belong to the elk*, is not in its proportions similar to the corresponding bone of the camel, but belongs to an animal with a shorter and thicker neck.

* See plate XLIV. and page 506.

VI.—*Examination of a Mineral Exudation from Ghazní.* *By* H. Piddington, *Esq.*

[Among the specimens of minerals and drugs received from Syed Kera'mat Ali, and collected by him while on Government employ in *Cábul*, as noticed in the Proceedings of the Asiatic Society, 7th October, 1835, a bottle containing a mineral exudation from Ghazní excited attention; it was labelled by Lieutenant Conolly,

"*Rock Chetny which, according to the Syed's informant, oozes out of a fissure in a rock at Ghizni. Native appellation Mumia? A. C.*"

Having placed this in Mr. Piddington's hands for chemical analysis, we now hasten to publish the account he has been so kind as to draw up of the results of his examination.—Ed.]

I.—*Description.* An unctious, viscid mass, semi-transparent, of a dirty light-brown colour, interspersed with small dark-brown and black specks; and mixed with angular fragments of calcareous rock, varying from the size of a lentil to that of a horse-bean.

The smell faint and sickly, and very peculiar. The taste pungent; when diluted with water sickly.

II.—*Tests.* 1. Solution in cold distilled water is turbid and clogs the filter; does not affect litmus or turmeric papers.

2. When boiled the same. The residue contained calcareous stones with a little siliceous matter, and a coarse bran-like powder, which when freed from the calcareous matter by dilute muriatic acid, proved to be the remains of half decomposed dung; evidently, by comparison with fresh dung, that of birds, and probably of pigeons or bats, &c. I recognised in it minute fragments of straw, pith, shells of seeds, &c. The brown and black specks were minute seeds, quite perfect, or fragments of a carbonaceous looking crust.

3. Boiled in highly rectified alcohol, silky crystals were left in the mass, which was now tough and pasty: these crystals were nitrate of soda. The alcohol evaporated was found to yield nearly pure nitrate of lime, mixed with a little fatty and very fœtid animal matter.

4. The solutions were tested by—

Oxalate of ammonia,	giving plentiful precipitate.	Lime.
Muriate of barytes; nitrate of silver;	slight cloud.	Trace of sulphates and muriates.
Sulphuric acid to concentrated solution;	nearly solidified it, and evolved fumes of nitric acid.	Nitric acid.
Gold leaf boiled in solution, with a little muriatic acid added;	dissolved.	Nitric acid.
Muriate of platina;	no effect.	No potass.
Tincture of galls;	no effect.	No iron.
Nitro-muriate of gold, Deuto-chloride mercury;	no effect.	No albumen.
Tannin;	no effect.	No gelatine.

To the chemist some of this may look superfluous, but I was always suspicious (and thought the fact worth ascertaining), that this singular looking compound might be artificial.

On platina foil, before the blow-pipe, it tumifies with strong effervescence, blackens, decrepitates with minute sparks, and passes into a whitish mass. The platina scarcely affected.

The bran-like matter left from the aqueous and muriatic solution, No. 2, was heated in a tube in which litmus and turmeric papers with a bit of silver foil were so disposed, that the vapour from the assay would pass over them. When heated, a strong ammoniacal (burnt feather) smell was evolved, followed by a sickly odour like that of turf, or tan refuse. The upper part of the tube was browned as from turf smoke. The silver foil and test papers were no way affected, proving the absence of sulphur or matters affording ammonia in this residuum.

Analysis.

In a compound necessarily so variable, little more satisfaction was to be expected from an analysis than the test afforded, saving that of being convinced that nothing had been overlooked; 400 grains of it gave

By alcohol and water,	Nitrate of lime, with a little fatty animal matter, ...	162·5
	Nitrate of soda, ...	23·5
By muriatic acid,	Carbonate of lime, from the rocky fragments,	136·5
	Water by an independent experiment,	62·0
	Residuum of dung of birds, with a very little siliceous matter and sulphate of lime, ...	9·5
		394·0
	Loss, ...	6·0
		400

Assuming the information on the label to be correct, we may suppose that the fissure from which this "rock Chetny" oozes communicates with some limestone cavern frequented by birds, (or in which are large deposits of animal matter,) from which or from the decomposition of the dung, as in many similar situations, the nitrates of lime and soda are formed and gradually ooze out. The presence of the vegetable remains and the absence of all traces of bitumen or sulphur, quite exclude the idea of its being "*Mumia*," as suggested on the label. I have somewhere seen it mentioned, that a nitre cave, as they are commonly called (I think in Kentucky), produces a matter assuming this unctuous, but not the viscid, state, but cannot now recollect the work.

VII.—*Corrected Character of the Genus Cuvieria of* Rang, *and notice of a second species inhabiting the Tropical Indian Ocean. By* W. H. Benson, *Esq. B. C. S.*

In my catalogue of Pelagian shells, vol. iv. p. 176, I mentioned that the capture of perfect specimens of the Pteropodous genus *Cuvieria* would enable me to correct the characters given by Rang, in his Manuel, from shells met with in the imperfect state in which they are usually found. I now redeem the promise implied in that communication. The following is the corrected character.

Cuvieria (Rang). Testâ symmetricâ, anticè subcylindriceâ, posticè elongato-conicâ, apice acutissimo, medio septo tenui, imperforato, concavo, versus apicem convexo, concameratâ; aperturâ suprà depressâ, subcordiformi.

Rang gives as a character "le côté opposé à l'ouverture fermé par un diaphragme convexe à l'extérieur, non terminal, étant débordé par les parois du cylindre;" and this is the general appearance of the shell, which in the numerous specimens captured by us, was, with the exception of two individuals belonging to the smaller species hereafter described, defective in the conical termination. One of these two, taken in my tow-net, I broke on extracting the animal; the other, which was secured by Lieut. Hatton, H. M. 62nd regiment, was kindly presented to me by him.

The ordinary condition of *Cuvieria* appears to be analogous to the truncation observable in *Bulimus decollatus*, and in some of the *Melaniæ*, in which the part excluded by a diaphragm is liable, from the loss of vascular connexion with the inhabited part of the shell, to become brittle and deciduous.

The larger species, *C. columnella* of Rang, the only recent one hitherto observed, is that which is most widely distributed, and was met with by us in the Southern Atlantic, as well as in the Southern Indian Ocean. The range of the smaller species, which differs in being about half the length of the other, and in being somewhat more depressed, and more ventricose laterally, appears to be more confined. I shall describe it from its resemblance, in its ordinary mutilated state, to a grain of rice, as

C. Oryza. Testâ lævi, intidâ, depresso-cylindrica, lateribus versùs septum ventricosioribus; apice elongato, peracuto.

Length $\frac{4}{16}$ of an inch, of which the spire occupies nearly one-half. Taken, from the 15th December, 1834, to the 1st January, 1835, in a tract of the Tropical Indian Ocean contained between the parallels of 8° 6′ south and 5° 0′ north, and between the meridians of 86° 38′ and 91° 0′ east from London.

VIII.—*Synopsis of the Vespertilionidæ of Nipal. By* B. H. Hodgson, *Esq. Resident at Katmandú.*

I have the pleasure to forward to you herewith the names and characters, which I have provisionally affixed to the *Vespertilionidæ* of the central region of Nipal. Without access to large museums and libraries, it is scarcely necessary to observe that the naming and defining of species can be but very imperfectly performed.

Rhinolphus.

* Prosthem. memb. sup. transversa. adpressa. Sinu frontali.

Rh. armiger, mihi. Bright brown, with darker membranes. Frontal sinus round, and furnished with a pencil of hairs. Nasal appendage very large quadrate, adpressed, skinny in the lower part, fleshy in the upper, shaped like a coat of arms, with double field; the superior and inferior fields separated by two parallel, subtrilobate ridges, whereof the upper is fleshy like the proximate field. The lips with a triple fold of skin on each side. The antitragus vaguely developed, and wavily emarginated. Snout to rump, $4\frac{1}{2}$ inches; tail $2\frac{1}{4}$; expanse, 22; weight 3 oz. Females and young males, of a duller, deeper-toned brown.

* Prosthem. memb. sup. erecta. haud sinu frontali.

Rhinolphus tragatus, mihi. Uniform deep brown, with the lips paler and rusty. Of the nasal appendage, the upper salient process is like a barred spear-head (♀), and the lower like a raised door-knocker. Antitragus considerably developed, so as to form a semicircular mock† oreillon, whence the trivial name. Lips simple, $2\frac{5}{8}$ inches in length; the tail $1\frac{7}{8}$; expanse, $15\frac{1}{2}$; weight 2 oz.

Remarks.—Both the above species have the pubic teats strikingly developed. In form they are just the same as the true or pectoral teats, and in size, even larger than the latter. At their bases is a distinct indication of a gland, under the outer coat of the animals. The ears of both species are 'tremblingly alive all over,' and capable of considerable movement and compression, whence perhaps the transverse striæ or rays by which they are distinguished. In both species, there is some appearance of tragal and antitragal development. In tragatus (rectè anti-tragatus), the latter is prominent. These animals have manners nearly similar to those of the true Vespertilios. So soon as it is dark, they come forth from the cavities of rocks, in groups, to skim the surface of standing crops, or to glide around and between umbrageous trees, in search of nocturnal insects, which

† N. B.—The *true* oreillon, peculiar to Vespertilio, is an enlargement of the tragus.

constitute their sole food. They make their exit rather sooner than the true bats, and always in considerable numbers. They are not migratory, nor subject to hibernation. They breed once a year, towards the close of summer, and produce two young, differing from the parents chiefly in the very restricted development of the nasal appendages.

PTEROPUS.

* Ecaudatæ.

Pt. leucocephalus, mihi. Whole head and neck, with the body below, rufous yellow; face, as far as the eyes, the body above, and the membranes, deep brown. Snout to rump, 10 inches. Expanse, 46. Weight, 22 oz.

* Caudatæ.

Pt. pyrivorus, mihi. Wholly of an earthy brown; nude skin of lips, of joints, and of toes, fleshy gray; tail very short, with its base enveloped in the interfemoral membrane, and its tip free. Snout to rump, six inches; tail, half an inch. Expanse, 24 inches. Weight, 5 oz.

Remarks.—The Pteropi never appear in the central region of Nipal, save in autumn, when they come in large bodies, to plunder the ripe fruit in gardens. The lesser species is a perfect pest, from the havoc it makes amongst the ripe pears. Hence I have called it pyrivorus. These animals are never seen in Central Nipal, save at midnight, at which time they come to feed, and necessarily from a very considerable distance. In the plains it is noted of them, that they will travel 30 or 40 miles, and as many back, in the course of a single night, in order to procure food.

VESPERTILIO.

V. formosa, mihi. Entirely of a bright, soft, ruddy yellow, with the digital membranes triangularly indented, blackish. Head, conical; face, sharp; muzzle and lips, confluently nudish; the former, anteally grooved, not above; outer and inner ears acutely pointed, moderate, less the head; teeth $\frac{2.2}{6}$ $\frac{1.1}{1.1}$ $\frac{6.6}{6.6}$ snout to rump, $2\frac{1}{2}$ inches; tail, 2; expanse, $12\frac{1}{2}$.

V. fuliginosa, mihi. Wholly sooty brown. Ears, lips, and muzzle, as in the last: and face sharp, but the rostrum somewhat recurved, owing to the concave bend of the nasal bones, which in *formosa* are rather convex. Teeth $\frac{2.2}{6}$ $\frac{1.1}{1.1}$ $\frac{5.5}{6.6}$. In size somewhat less than *formosa*.

V. labiata. Thick-lipped Bat, mihi. Head broad and depressed, with a bluff physiognomy, and all the organs placed low down on the sides of the head; muzzle, small, clearly defined, rounded, grooved; lips very tumid, but not warty nor nude; ears shorter than the head,

remote, erect, spheroidal: auricle of the same form, and directed towards the conch of ear; posterior margin of the helix folded outwards, and carried forwards to the gape.

Saturate brown throughout. Skin, wherever denuded, purpurescent. Teeth $\frac{2.2}{6}$ $\frac{1.1}{1.1}$ $\frac{6.6}{6.6}$; snout to rump, three inches; tail, two; expanse 15.

Remarks.—The bats remain with us throughout the year, and do not hibernate. They quest for food solitarily, and therein chiefly their manners differ from those of the Rhinolphi. Labiata is closely affined to M. Geoffroy's Noctula, and has a very different physiognomy from the other two species, which have both a sharp visage, though their crania exhibit in the facial part a considerable diversity, In Formosa, the nasal bones are slightly convexed in their length, and unite easily with a low forehead: in Fuliginosa, the same bones incline to a concave bend in their length, and join a high forehead, with a considerable curve.

IX.—*Note on the Red-billed Erolia. By the same.*

With reference to the paper on the Red-billed Erolia, published in your No. for August, I beg to acquaint you that I have been induced to adopt a new genus for this bird, and that the change of the generic has led me to the alteration of the specific name also. As I am no friend to the multiplication of names, I would observe, that in adopting a new genus, I have been governed by these two circumstances—1st, that Vieillot's genus Erolia has been rejected; 2nd, that Gould's genus Ibidorhyncha is inaccurate. I have had opportunity to examine three specimens, and from careful comparison of them, have drawn the following generic character.

Genus Clorhynchus.

Rostrum omnino Numeniacum: differt tamen tomiis inflexis denticulatisque, necnon apicibus acutiusculis.

Corporis, alarum caudæque forma sicut in Grallatoribus typicis.

Tibiæ et tarsi sub-breves, tibiæ trans medium plumosæ, teres: tarsi leviter reticulati.

Pedes tridactyli typicè cursorii, marginibus tamen digitorum subdilatatis, externoque digito libero.

Species nova. *Cl. Strophiatus*, Anglicè *Gorgeted Clorhynx*.

Cl. corpore supra, colloque plumbeis. Caudâ pallidiore, fasciisque nigris transversim instructa. Corpore subtus albo. Capitis vertice, facie, guttureque nigris. Pectore strophio nigro ornato. Iridibus rostroque sanguineis. Pedibus purpurescente griseis.

Synonyma. *Red-billed Erolia* of Asiatic Journal. *Ibidorhyncha Struthersii* of Gould's Century.

The denticulation of the bill, and the strictly cursorial character of the feet, (with short, stout, very unequal, full, solid toes, and depressed truncated nails,) constitute, I conceive, *the* marks of this genus.

The species is 16 inches by 30 in length and extent, and 10 oz. heavy.

The intestines are 20 inches long, larger above than below, tough, frequently semi-convolved or doubled, syphonwise, and at three inches from the anal end, they have two cæca, nearly two inches in length, each of them.

The stomach is small, but very muscular and gizzard-like, and the food of the species, chiefly, minute univalve mollusca, which it picks up on the sandy margins of rivers and streams. In such sites it is usually found; nor does it appear to be gregarious.

The generic name Clorhynchus, is derived from Clorios, a Greek term for the curlew. The trivial name bears reference to the conspicuous gorget borne on the bird's breast. Had the former specific name (red-billed) been retained, there must have been tantological intrusion on the generic style, upon turning the specific appellation into Latin or Greek: hence the change.

Time and the discovery of more species will prove whether my generic character be worthy of retention. Quoad the single known species it is, I hope, both accurate and distinctive.

X.—*Description of the little Musteline animal, denominated Káthiah Nyúl in the Catalogue of the Nepálese Mammalia. By* B. H. Hodgson, *Esq. Resident at Katmandu.*

Genus.—Mustela.

Sub-genus.—*Putorices.*

Species new. *P. Káthiah*, mihi. The *Káthiah Nyúl* of Nepal. Habitat, the Kachár or Northern region. Specific character, deep rich brown above, golden yellow below, chin whitish. Tail, limbs, and ears concolorous, with the body above. Tail cylindrico-tapered, and half the length of the animal. Snout to rump, 10 inches: tail (less hair) 5 inches.

This beautiful little creature is exceedingly prized by the Nepálese for its services in ridding houses of rats. It is easily tamed; and such is the dread of it common to all murine animals, that not one will approach a house wherein it is domiciled. Rats and mice seem to have an instinctive sense of its hostility to them, so much so that

as soon as it is introduced into a house, they are observed to hurry away in all directions, being apprised, no doubt, of its presence by the peculiar odour it emits. Its ferocity and courage are made subservient to the amusement of the rich, who train it to attack large fowls, geese, and even goats and sheep. The latter, equally with the former, fall certain sacrifices to its agility and daringness. So soon as it is loosed, it rushes up the fowl's tail, or goat's leg, and seizes the great artery of the neck, nor ever quits its hold till the victim sinks under exhaustion from loss of blood.

The Káthiah has the true vermiform structure of the typical musteline animals; its head, neck and body forming a continuous equable cylinder. Its action is purely digitigrade, and even the palms and soles of its extremities are clad in hair beyond the limits of the lines defining the digits, and the balls supporting them and the wrists. The fore and hind legs are of equal and moderate thickness; but the hands are rather larger than the feet: both quinquidactylous, with the thumbs or internal digits a little withdrawn, as in the human hand. Of the rest of the digits, the two central are equal, and the two lateral, sub-equal, especially in the hinder extremities. Four oblong conjunct balls support the bases of the digits, and two the palms, an outer large ball of an elliptic shape, and a tiny round one its inner side. No metatarsal balls exist in the hind feet. The digits are more than half involved in a dilatable membrane which spreads freely to aid grasping. The talons or nails are all of sub-equal size, compressed, curved, and acute, suited to scansion and tearing, but not so well to digging. The fur is short, shining, and adpressed; that of the tail being a little larger, but not much so. The tail itself (i. e. exclusive of the hair which projects beyond its termination) is just half the length of the animal, and is slender, round and tapering. The head oval, with a short conical face ending in a clearly-defined round muzzle, having the nostrils entirely to the sides. The eyes are prominent, with round pupils, and they are seated much nearer the snout than the ears. The hairs issuing from the lips, cheeks, chin, and brows, are not rigid or thick; and a slight tuft of a similar character is set on above each carpus, as in some of the squirrels. The ears are lateral, transversely developed, formed upon the general model of the human ear, and more nearly of that of the mungooses. There is helix and antihelix, tragus and antitragus; but no lobe. Those who are familiar with the structure of the ears in the common Indian mungoose (*Herpestes Griseus*) will understand the exact form of the same organs in our animal, when I tell them that the only differences consist in the helix of the latter being more exserted, but not pro-

duced anteally towards the eyes, nor reflected on the edge. The helix too, is entire in the mungoose; whereas in the Káthiah weasel, it has a large simple fissure in the posterior part, resembling that of *Martes Flavigula*. The front teeth stand free of the canines in the upper jaw, in contact with them in the lower, wherein the intermediate ones are ranged rather within the line of the rest of the teeth. Molars, $\frac{4}{5}.\frac{4}{5}$. The great carnivorous tooth in the upper jaw has a small flatish heel on the internal side, placed forwards, and at the base of great cutting process. The same tooth in the lower jaw has no transverse or lateral process; but the third longitudinal tubercle is nearly flattened on its crown, and the hindmost or fifth tooth in this jaw is small, and nearly flat-topped. The hindmost or fourth molar of the upper jaw runs transversely, and has two obtusely-conical points.

A horrible offensive, yellowish grey fluid exudes from two openings, placed laterally just within the sphincter ani. The scrotum is nearly without hair, and not larger (including the testes) than a marrow-fat pea. The omentum as delicate as a spider's web, and without a particle of fat.

The liver divided into six lobes. A small pea-like gall-bladder is deeply imbedded in the largest lobe. The stomach is nearly pyriform, and purely membranous; the œsophagus entering it close to the fundus. Length of stomach, $3\frac{1}{4}$ inches; greatest diameter, $1\frac{1}{2}$ inch. Spleen, $1\frac{3}{4}$ inch long, $\frac{1}{8}$th of an inch in diameter. Coats of stomach thin, almost transparent. Entire length of intestinal canal, four feet, of uniform calibre, from the pylorus to the vent. No cæcum. Length of animal from snout to vent, 10 inches. This gives less than five times the length of body to the intestines. Lungs, six lobes, four right, two left.

XI.—*Further Discovery of Coal Beds in Assam. By Captain* F. Jenkins.

[Extract of a letter, dated Goalparah, 5th December, 1835.]

I wrote you sometime back that we had fallen upon a shell limestone in the *Nowgong* district, similar in all respects to that of Sylhet; there was every reason, therefore, to suppose, that we should find coal associated with the limestone, as to the south of the *Khásia* hills, and I have just now the satisfaction to report that this has been realized, and to send you small samples of coal that has been sent down to me by Ensign Brodie. If I am not mistaken from the appearance, it will turn out to be a valuable and highly bituminous coal, and I shall be much obliged by your reporting upon it. A large

supply of it has been brought down for me to *Gowahatti*, from which, on my return, I will dispatch a good quantity to you. Of course what we have now to show are merely chance pieces, brought in by persons we put in search, and many of them are slaty and earthy; but what I send you, is sufficient, I hope, to show that there are good coal beds connected with these. I do not exactly know the site of this deposit; but I believe it has the advantage of being within reach of navigable nullahs; it is on a nullah falling into the *Jumuna*, a river which divides *Cachar* from Assam, and joins the *Kopili*, the *Kalung*, (a branch of the *Brahmaputra*,) and other streams entering the *Brahmaputra*, a little above *Gowahatti*. This will be a most convenient site whence to draw supplies of coals, if the quality turns out suitable for steamers, whenever there be occasion for sending any in this direction. It now becomes almost certain that we shall find very large supplies of this invaluable mineral on the south bank of the *Brahmaputra*; we know already of four places where coal has been found, viz. 1st, under the Caribári hills; 2nd, that of the Dharmpur Pergunnah; 3rd, on the Suffry, a nullah near the Borhat salt formation, and 4th, on the Noa Dihing, in the Singpho district, south of Sadiya. We may besides of course confidently expect to find coal on many intermediate spots, when we come to be better acquainted with the province.

Note.—The three specimens of Assamese coal, received with the above note, turn out to be of very respectable quality; they are rather slaty in fracture, and do not coke; but burn with a rich flame, being very bituminous: on this account they would be very suitable for steam engine fires, though unfit for the forge, or for the smelting furnaces. Analysed in the usual way, they yielded the following ingredients:

	No. 1.	*No.* 2.	*No.* 3.
Volatile matter, expelled by coking process, ...	63.1	56.9	62.8
Carbon, ascertained by incineration of coke, ...	29.6	31.1	29.0
Earthy residue, ...	7.3	12.0	8.2
	100.0	100.0	100.0

The weight of the three coals gives a somewhat different result, No. 2, being the lightest, and consequently the least earthy, of the three.

viz: No. 1. has a specific gravity, ... 1.226
2, ... 1.196
3, ... 1.223

J. P.

XII.—*Synopsis of Fossil Genera and Species from the upper deposits of the tertiary strata of the Sivâlik Hills, in the collection of the authors. By Capt.* P. T. CAUTLEY, *Supt. Doáb Canal, and* H. FALCONER, *M. D. Supt. Botanical Garden, Seháranpur. Northern Doáb, Nov. 15th,* 1835.

I. PACHYDERMATA.

1. Elephas.
   1. *E. Primigenius.*
2. Mastodon.
   1. *M. Elephantoides** { M. Latidens. Clift. / M. Elephantoides. Clift.
   2. *M. Angustidens.*
3. Hippopotamus.
   1. *H. Sivalensis.* (Nob.)
   2. *H. dissimilis.* (Nob.)
4. Rhinoceros.
   1. *R. angustirictus.* (Nob.)
   2. (undetermined.)
5. Equus.
   1. *E. Sivalensis.* (Nob.)
6. Porcus. (Species undetermined.)
7. Anoplotherium.
   1. *A. posterogenium.* (Nob.)
8. Anthracotherium.
   1. *A. Silestrense ?* (Pentld.)
9. Chœrotherium. (Nob.)
   1. *C. Sivalense.* (Nob.)

II. RUMINANTIA.

10. Sivatherium. (Nob.)
    1. S. *Giganteum.* (Nob.)
11. Camelus. (Species undetermined : two undoubted.)
12. Cervus. (Species undetermined : numerous.)
13. Antilope. (Species undetermined : numerous.)
14. Bos. (Spec. undetermined : 1 new sect. in the genus.) Indications in teeth, &c. of other genera.

III. RODENTIA.

15. Hystrix.
    1. (Spec. undeterd.)
16. Mus. (Spec. undeterd.)

{ Dádupúr collection : vide CAUTLEY's letter, Jour. A. S. Oct. 1835 ; p. 586.

* We consider the *M. Latidens*, and *M. Elephantoides* of Clift (Transactions of the Geological Society,) to be varieties merely of one species, dependent on age and sex.—C. and F.

IV. Carnivora.

17. Felis. (Spec. large: No. and character undetermined.)
18. Canis. (Species undetermined.)
19. Hyæna. (Species undetermined.)
20. Amyxodon. (Nob.)
    1. *A. Sivalensis.* (Nob.)

Indications of other genera.

V. Reptilia.

21. Crocodilus.
    C. Biforcatus ?
22. Gaviala.
    G. Gangetica ?
23. Emys. (Several species undetermined.)
24. (Trionyx. (Several species undetermined.)

VI. Pisces. (Heads, vertebræ, &c. of unknown fishes.)

VII. Testacea. (Univalves and bivalves undetermined.)

XIII.—*Note on the Asurhár of the Rájmahal Hills. By Capt.* H. Tanner.

[The following letter has reference to an extract from Buchanan's geological account of the Rájmahal hills, to which the Editor drew attention on the cover of the May number of the Journal, in consequence of a report having reached him that fossil bones had been discovered in the same range of hills towards Burdwán. This present information removes any hopes of meeting with the expected fossils, and may save the trouble of further search; for reference sake, the passage is here reprinted:

"The other calcareous matter, in mass, is called *asurhár*, or giant's bones. The greatest quantity is found at a place, in the centre of the hills, called *asurni*, or the Female Giant. As the lime, produced from this substance, is whiter and better than that made from the nodules, a great part has been removed. It occupied a space, on the surface of the declivity of a hill, about 40 or 50 yards in length; and from the bottom of the hill, extended upwards, from ten to forty yards, and seems to have formed a crust from 2 to 3 feet thick, covered by a thin soil, filled with loose masses of stone. It has evidently been fluid, or at least gradually deposited from water, as it has involved many fragments of stone, some earthy matter, and a few univalve shells, of a species with which I am not acquainted, and cannot therefore say, whether they are a marine or land production*. The masses of stone that had been involved vary from the size of the head to that of a walnut, and the *asurhár*, or calcareous tufa, does not adhere very firmly to them; so that in breaking, the mass being very hard, these nodules are generally shaken out. Near the quarry I saw no rock; but all the fragments involved, and those under the calcareous matter, are of a dark-coloured siliceous matter. In this place I saw appearances that, in some measure, justify the native name; for one piece of the *asurhár* contained what had very much the appearance of a flat bone, with a process projecting at one end. I also observed a curious impression, a semi-cylinder, about three inches in diameter, and 18 inches long, not quite straight, and exposed to view, as if, by breaking the rock, the other half of the cylinder had been removed. The surface of the cavity was wrinkled with transverse folds, like the inside of an intestine, but may have possibly been the bark of a tree, although I have seen no bark with such wrinkles; I rather suppose that this has been the impression of some marine animal. The greater part of this *asurhár*, as I have said, has been burned by Mr. Christian, a Polish merchant of Monghyr, who, I am told, owing

* I have since found these shells in the rivers of Gaya.

to the expense of carriage, did not find it advantageous. His overseer gave me a piece of it crystallized, which differs, in some respect, from any calcareous spar that I have seen. I myself found no crystallized matter in any of the *asurhár*. This substance is also found close adjoining to the hot sources of the Angjana river, and by the natives has been wrought to a trifling extent. It is in a stratum, about a foot thick, lying on loose siliceous stones, to which it adheres, and is covered by about a foot of soil, mixed with stones. So far as I saw, it contained no animal *exuvia*.

"On the stones, through which the hot-water issues, both of the sources of the Angjana, and at Bhimbandh, there adheres a tufaceous matter, so like this *asurhár* that I at first sight concluded it to be the same; but on trial, I found that it does not effervesce with the nitric or muriatic acids, and is probably of a siliceous nature."—Ed.]

My attention was first directed to *Asurni* by the Superintendent of Buildings having requested me to search for limestone in the neighbouring hills. I heard from natives, that Captain (late General) Garstin had procured lime from that place to build the Government granary at Patna.

I proceeded there in November, 1819, and encamped 12 days in the valley.

Natives who had worked for General Garstin, and subsequently for Mr. Christian, described the lime rock as a large mass at the foot of the hill, of considerable height, inclining over to the north, so as to afford shelter when it rained; and when it was quarried, they placed fire underneath, to heat the stone, and then poured water from above, to burst it.

I conceived some remains of a stratum might be found, and had a trench excavated some distance along the base of the hills, another intersecting it up the slope, but could only find incrustations on the fragments of siliceous stones, some nodules imbedded in the scanty soil, a few of them crystallized; but all were indiscriminately called *asurhár* by the natives, without reference to form, merely from the porous texture.

I found a superior sort of tufa at various places in the valley, and remarked that each lump formed invariably, as if from percolation, round the roots of the *sal-hur* tree, thickest near the tree and thin towards the edges, and in many instances extending along the thin roots, assuming a cylindrical form, but not perfectly round: these were also called *asurhár*.

The lime from this species of tufa was considered so good, that the Superintendent wished for a large quantity, for the purpose of white-washing, but the cost of transit across the hills was too great.

I availed myself of the "Jellinghí," passing the other day, to send you a sample of actynolite; it is only a few inches long, but generally the pieces are two or three feet long and a foot thick, standing vertically on each other to a great height, presenting a precipice of columns, near to *Asurni*.

XIV.—*Extract from a Meteorological Journal kept at Kandy, Island of Ceylon. By Captain* Ord, *R. E.*

Date.	Thermometric Range.							Rain-guage.	
1833 and 1834.	Monthly Range.		Greatest Range in 24 hours.		Least Range in 24 hours.		Mean Temp.	Rain fallen.	Fallen in 24 hours.
Month.	Max. and Min.	Range	Max. and Min.	Range	Max. and Min.	Range		In the month Inches.	Max. and Min.
Nov. ..	81·25 66·5	14·75	80·5 67·	13·5	74·5 69·	5·5	72·	9·3	1·6 0.
Dec.....	79·5 62·5	17·	79·5 62·5	17·	72·5 69·5	3·	72·3	7·85	1·75 0.
Jan.....	82· 59·	23·	81· 59·	22·	73·5 69·5	4·	71·8	7·0	3·8 0.
Feb.....	85· 59·	26·	81· 59·	22·	75·5 70·	5·5	73·5	1·75	1·4 0.
Mar. ..	88· 59·	29·	88· 65·	23·	81· 71·	10·	75·5	6·25	1·8 0.
Apr.....	84·5 61·	23·5	81· 61·	20·	76· 70·	6·	73·3	6·25	1·95 0.
May. ..	85· 65·	20·	83·5 65·	18·5	75·5 74·	1·5	76·3	2·	1·0 0.
June. ..	81· 69·	12·	80· 70·	10·	74· 71·	3·	73·8	10·	2· 0.
July. ..	78·5 69·	9·5	78· 69·5	8·5	73·5 70·5	3·	72·7	8·7	1·8 0.
Aug. ..	81·5 66·	15·5	81·5 66·	15·5	73· 70·	3·	72·3	8·45	2·8 0.
Sept. ..	82·5 66·5	16·	81·5 68·5	13·	75·5 69·5	6·	73·1	4·0	8· 0·
Oct.....	85· 63·5	21·5	85· 64·5	20·5	75· 70·	5·	72·7	7·1	0·9 0·

N. B. Highest range in the shade, 88°. Lowest, 59°. Mean Temp. of the year—73·3. Total quantity of Rain—inches, 78·6

Remarks.—Kandy is situated in a mountainous district, in Lat. N. 7°18′;—Long. 80°49′, and at an elevation of about 1680 ft. above the level of the sea. It is so surrounded by high hills, as to render both the direction and force of the wind very difficult to be obtained—but it is strongly affected by both monsoons.

XV.—*Postscript to the Account of the Wild Goat of Nipál, printed in the September No. of the Journal, page* 490. *By* B. H. Hodgson, *Esq.*

Carefully as I thought my account of the wild goat of Nipál, recently published by you, was executed, I find that there is one material error in it, viz. the statement that the species has only two teats or mammæ. A recent dissection of a fine male led to the notice of the fact, that there are four teats, which fact was confirmed by the examination of two live females. There can, therefore, be no question that this species of goat has four teats: and the circumstance is so remarkable, that I propose to substitute the name Quadrimammis, or four-teated; for the popular name of Jhâral under which I described it. Deer are distinguished by four teats; goats and sheep, heretofore, by two; the intermediate genus, antelope, by four or two, in the several species. *Capra Quadrimammis vel Jhâral*, by its four teats, offers a singular and unique approximation (in this genus) to *cervus;* and another proof that the infinite variety of nature cannot be designated by our artificial signs and peremptory divisions. *Antilope, capra*, and *ovis*, how shall we contradistinguish them? solid cored horns, in the first, is no unerring mark: and now we have a species of the second, and a *beardless* species too, abandoning his congeners to tally himself with cervus—quoad, the number of mammæ.

XVI.—*Analysis of Raw Silk. By Mr.* J. W. Laidlay.

A. A hundred grains of yellow raw silk were digested in moderately strong alcohol, which soon assumed a fine orange tint. At the end of some days, much colour remaining unremoved, heat was applied, and the solution gently boiled. The alcohol was then decanted, and successive portions of the same solvent were employed, till the silk appeared perfectly decolorized. The solutions were then reduced to a moderate compass by distillation, and on cooling deposited a feeble cloudy precipitate, which subsided slowly. The clear fluid being decanted, and evaporated at a gentle heat to dryness, left a deep orange brown mass, which weighed 0·9 grains. This substance was adhesive, fusible, scarcely, if at all, soluble in water, but readily so in alcohol, to which in small proportions it communicated a fine orange tint. A concentrated solution deposits on cooling a vast number of minute shining crystals, which subside to the bottom in the form of a brilliant orange-brown powder. When this precipita-

tion has ceased, the solution lets fall, by spontaneous evaporation, a few filamentous bunches of a white colour, and apparently fatty nature; but in quantity too small for more particular examination.

B. The flocculent precipitate above mentioned, being collected and dried, weighed 0·1. It had the consistency, fusibility, and other sensible properties of wax.

C. The silk, still perfectly elastic, was now transferred to a deep silver vessel, and boiled with successive portions of distilled water as long as any sensible action was produced. A colourless, opalescent solution was obtained. It was frothy and viscid; and exhibited scarce any tendency to deposit the particles it held in suspension. A solution of bi-chloride of mercury, cautiously dropped from a graduated tube, threw down a bulky coagulum, which after boiling, became much condensed, and permitted the easy decantation of the clear fluid. This precipitate, well washed and dried, weighed (deducting 1·4 grains, the amount of metallic salt employed), 8·9 grains. It had all the well known characteristics of albumen.

D. The clear fluid decanted in process C. being evaporated to dryness in a steam bath, left a nearly colourless, transparent, brittle mass, resembling gum. It weighed 13·0 grains, and had a tendency to soften, from the presence of a small quantity of deliquescent salts. It dissolved readily in water, from which neither the bi-chloride nor tan threw it down. It exhibited no tendency to gelatinize, however concentrated; and was copiously precipitated by sub-acetate of lead.

E. Alcohol now took but a feeble tinge from the silk, which still retained a little harshness. A very dilute solution of caustic potash was accordingly exhibited; and after a few hours digestion, was poured off, exactly neutralized with muriatic acid, and treated with the bi-chloride as in process C. The precipitate of albumen thus obtained weighed 0·4 grains.

F. Finally, the silky fibre, which had now attained its full lustre and flexibility, weighed 76·5; exhibiting a loss of 0·6 upon the total, attributable to hygrometric moisture; the whole of the products being dried at a steam heat immediately before weighment. The following are the results of the analysis:

A.	Resinous colouring matter, and white filamentous substance, ...	0·9
B.	Wax, ...	0·1
C. and E.	Albumen, ...	8·9
D.	Mucus, ...	13·0
F.	Bleached fibre, ...	76·5
F.	Hygrometric moisture, ...	0·6
	Grains,	100.0

An analysis of white silk gave identical products; and in amount differing only fractionally from the above; except in the particular of the resinous colouring matter, which was indeed present, but in a very much smaller proportion. It is probable that the varieties of colour observable in cocoons, the yellow, the orange, the buff, the white and the greenish hues, depend only upon the greater or less amount of this resin in the fibre.

XVII.—EXTRACTS FROM CORRESPONDENCE.

1. *Note regarding the Bhilsa Monument. By Dr.* SPILSBURY.

With respect to the Bhilsa monument, I see Mr. HODGSON also agrees in thinking it similar to the Manikyála tope, and which I have been at you so long about, and for which reason I sent you a selected drawing. With regard to apartments within, none exist. When Mr. MADDOCK was Political Agent at Bhopal, he obtained leave from that Government to dig into it, and I visited it soon after, (in December, 1822,) when Captain JOHNSON, his Assistant, had completely opened it from the top to I think about 30 feet below the level, and to what he considered, the bottom of the foundations, and found the whole solid brick-work, without any appearance of recess or open space of any kind. FELL should have stated that the gate-ways are four, three of which are standing, the fourth having been thrown down by an earthquake, the whole of which is strewed on the ground, and that in no long time, another will follow: it would be well worth an amateur's while to take copies of the compartments, the sculpture of which is like nothing you see in India. There is another style of sculpture that I have seen from Kallinjer and Adjeegurh down as far south as I have been—some of them magnificent temples and ruins, always indecent, frequently highly obscene—sculpture that I have never remarked in any part of the provinces: to what era does it belong?

2. *Note on the Sárnáth Building, by the Baron Hugel.*

Je joins quelques mots à ma lettre pour vous faire quelques remarques sur le Sarnath et le Atala Mosjid à Juanpur.

Le Sarnath, ce Dagoba (ou Dhagoba) des Buddhistes, ce qui par parenthese peut être l'origine du nom Pagoda par l'anagram des syllables, est d'une forme inusitée en Ceylon ou parmi quelques centaines qui j'y ai vu depuis les petits près de Colombo, jusqu'aux immenses d'Anaradjapura, toutes différentes l'une de l'autre, aucune n'a la forme du Sarnath. Tout ceux de Ceylon ont un second batiment sur le premier: mais celui-ci dans son dessein ne forme que l'accessoire, comme la lanterne à la coupole moderne, pendant que le Sarnath a dans son dessein le batiment d'en haut pour objet principal; pour lequel la partie d'en bas n'est que le fondement, la base: ces Dagobas sont toujours batis sur un quarré qui (chez les petits, et le Sarnath est de ce nombre) ne forme que partie d'un plus grand quarré, qui contient l'entrée et une Vihare: ces deux quarrés sont visibles dans les debris du Sarnath.

La relique sur la quelle l'édifice est batie se trouve toujours au niveau du premier quarré: mais pas toujours au milieu. L'Atala Mosjid à Juanpur cet decidemant un ancien Agar, je crôis que e'est le nom, ou maison d'école Buddhu: une de ce genre se trouve à Bijapur, et plusieurs en Ceylon, dont la plus grande et celle mentionnée par TURNER dans son Epitome, nommé dans les auciennes cartes de Ceylon, 1000 colonnes. Celle de Juanpur contient 1060 colonnes ou plutôt pilastres détachés, (colonnes quarrées est une fausse dénomination:) J'ai cherché mais en vain de trouver une inscription sur ces colonnes à Juanpur, mais je suis sure qu'une personne avec plus de tems que j'avois moimème finirait par en

trouver une. Dans tous les autres édifices à Juanpur se trouvent des fragmens de monumens Buddhistes. Quel était l'ancien nom de cette ville?

3. *Note on the occurrence of the Bauddha Formula.*

Turning by accident to the copy of the inscription on an image of Buddha, found along with two urns in the excavations at Sarnath, made in the year 1798, and described by J. DUNCAN in the 2nd volume of the Asiatic Researches, I was much pleased to discover the identical sentence "*ye dharmma hétu prabhava, &c.*" about which so much discussion has lately taken place, occupying the two bottom lines of the page. They are disguised by several very gross errors of the copyist, and it is therefore not surprising that no attempt should have been made by WILFORD, who alludes several times in his essay to the other part of the inscription, or by other Sanscrit scholars, to read it; the lines are thus given:

खधर्म्महेतु प्रकरोहेतुं तेषां तथाफले ह्यवदत्
तेषां च यनविरोधावंतांदो महा श्रमणः।

By comparing this with the version given in page 137, its real accordance will be at once perceived through the disguise of numerous blunders.—J. P.

4. *Extracts from a Journal of a Residence, and during several Journeys, in the Province of Behar, in the years* 1831 *to* 1834. *By Mr.* J. STEPHENSON.

Lunar Iris.

I had the pleasure of observing this beautiful phenomenon two miles to the east of Singhea in Tirhut, at 5 A. M. on the 4th of August, 1831. It appeared in the eastern part of the sky, the moon being in her last quarter, and only a few degrees about the western horizon. The prismatic colours were distinctly developed, and the arch perfect, though not so intense as those generally seen in the solar iris. The radius of the arch appeared also less than the one formed by the sun. It remained distinctly visible for the space of 15 minutes; after which it gradually lost its radiancy, and disappeared. The morning was cloudy, with light showers of rain, and the temperature 85° of Fahrenheit.

I have reason to observe that this phenomenon is not of frequent occurrence; for this is only the second one I have seen during my life-time.

Frost Rind, January 16th, 1832.

The native thatched huts in the village of Singhea in Tirhut were this morning covered white with a frost rind, although the thermometer did not indicate a lower temperature than 46° of Fahrenheit, with light airs of wind from the west.

Beautiful Meteor observed near Singhea, Tirhut, April 11th, 1832.

At four hours 45 minutes A. M., and at day-break, observed a meteor in the form of a globular ball of fire, which passed through the air, from west to east, in a horizontal direction, and with a motion moderately rapid. Its size appeared to be about a foot in diameter, having a fiery train of the most splendid brilliancy, apparently many yards long. It illuminated the country as far as the eye could reach, and remained visible for five seconds, after which it exploded like a rocket throwing off numerous corruscations of intense light; but without any report or noise of any kind. Its apparent elevation inconsiderable.

Another beautiful Meteor observed at the same village on the 20th of May, 1832.

At 6 hours 40 minutes P. M. a large pear-shaped meteor was observed shooting very rapid in a horizontal position, and in a direction from N. to S. Nothing could exceed the brilliant mixture of green, tinged with blue colours, exhibited during its rapid progress. It left a luminous train of great length behind, and remained visible about three seconds, then disappeared in the southern horizon, without exhibiting any signs of exploding.

Remarkable Phenomenon seen opposite Singhea, in Tirhut, July 15th, 1833.

This evening, during a thin shower of rain, I observed on the opposite side of the great river *Gandak*, at the distance of two miles, the phenomenon called by the natives "*Rája Harchand ka Pura.*" An aërial city appeared, with its

palaces, temples, houses, spires, columns, &c. forming altogether a very beautiful spectral appearance, which remained visible for the space of 10 minutes; after which, it began to alter its appearance, becoming faint and dilapidated, till it gradually disappeared altogether with the passing shower. This phenomenon I do not remember to have ever before seen. It seems to differ from what is called the *Fata Morgana* in Italy, and I think, partakes more of the nature of what is called the *French Mirage*, for I observed no reflection on the intervening water; but it was considerably elevated above the west bank of the river, directly above a grove of mango trees, which were not seen during the shower of rain, and I suppose caused this very singular appearance by the refraction, or reflection of the atmospheric air, of different densities, surrounding the grove.

Parhelia or Mock Suns, 19th May, 1834.

About 5 hours 30 minutes P. M., I observed the most singular and beautiful phenomenon I ever beheld. A dense black cloud, (cumulus,) of a large size, formed itself to the west of *Singhea*. The sun had just retired behind it, when suddenly there appeared on the upper edge of the cloud four *parhelia*, or *mock suns*, exhibiting the most brilliant colours of green, blue, and scarlet, intermingled, which neither pen nor pencil could describe. The upper part of the cloud was fringed with *radii*, or small innumerable black rays, shooting upwards with a slow but perceptible motion.

To heighten the already beautiful effect, in a few minutes the sun burst through an aperture in the middle of the cloud, with a splendour past description. This phenomenon remained visible for the space of ten minutes, when it gradually disappeared, and heavy lightning succeeded, flashing its way towards the south-east.

Sand Columns.

During my travels in *Behar*, I had frequent occasion to notice this phenomenon on the desert sand-banks of the Ganges. The first I ever saw was between *Rajmahal* and *Sicligully*, on the 23rd of November, 1830. Several sand columns formed from twenty to sixty feet high, having a whirling motion similar to a water spout at sea. They passed at about half a mile distance, and remained visible for five minutes.

Feb. 10th, 1833. Observed several sand columns on the large island between *Bar* and *Mowah*. The whirling motion was very perceptible, and they rose in a perpendicular column to more than 100 feet. They only remained whole a few minutes, when they gave way at the base, and dispersed in a cloud of sand.

Feb. 25th, 1833. On the sands formed by the confluence of the river Soane with the Ganges, we observed two large sand columns, which reared their heads to a great height in the atmosphere, with an obvious whirling motion. The apparent diameter of each seemed to be twelve feet. They remained perfect for the space of several minutes, and then gradually dispersed, forming a cloud of sand, which remained visible for a considerable time, till wafted away to the east, by a slight breeze of wind from the west, which just ruffled the surface of the Ganges.

These sand columns have not passed unnoticed by the natives, who call them *Bundoah*. I was told by a respectable native that instances have been known of people being caught in the whirl, and either killed, or severely hurt by their force. I have to notice that on every instance that I have observed this phenomenon, the sky was clear, and not a cloud to be seen.

Bruce was one of the first to describe these columns in his travels to discover the source of the Nile. That celebrated traveller describes them as tremendous, overwhelming, and destroying whole caravans of men and cattle.

In Burnes' travels, I find mention made of them under the name of whirlwinds: "In this neighbourhood (meaning the desert), and more particularly while on the banks of the river, we witnessed a constant succession of whirlwinds, that raised the dust to a great height, and moved over the plain like water-spouts at sea. In India, these phenomena are familiarly known by the name of *devils*; where they sometimes unroof a house; but I had not seen them in that country either of such size or frequency as now prevailed in the Turkmán desert. They appeared to rise from gusts of wind, for the air itself was not disturbed, but by the usual north wind that blows steadily in this desert."

I dare not venture an opinion with reference to the cause of this phenomenon; but in all probability it is the same that creates water-spouts at sea. However, when a sufficient number of well-described facts are made known, some future Sir ISAAC NEWTON may collect and form a theory from them upon a firm basis, and if this notice contribute but an iota towards it, I am well rewarded.

Mirage seen on the 15th Dec. 1832, near Jandaha in Tirhut.

A little to the east of *Barbatta Ghât*, on the *Byah Nullah*, is a wide extended plain, without trees or jungle of any kind; nothing of vegetation is to be seen, except a stunted species of grass, which serves to feed numerous herds of cattle, that seem to thrive on this sterile waste: patches of saline matter are here and there to be seen white with efflorescence. On the above day, I travelled across this plain, and at 3 P. M., observed the phenomenon of *Mirage*. Every object in sight was rendered five or six times its ordinary size. The men and cattle appeared gigantic spectres, stalking about in the distance; a few of them appeared as if walking on *stilts*, while some of the buffaloes' heads seemed larger than their bodies. A few were elevated to such a height, that their legs appeared like the trunks of palm trees. These distortions continued to change as the objects moved about, to such a degree, that the men and cattle changed their shapes every moment like shadowy spectres. A transparent bluish kind of vapour could now and then be seen when stooping down, and looking towards the horizon, and having an undulatory motion, which, I have no doubt, caused this phenomenon. It is, however, not common, for my servants, when asked about it, looked grave, and their countenances expressed more of fear than curiosity; while at the same time, they did not like to talk or say any thing on the subject. They, however, stated, that it was something not good, and that "*many people would die after seeing it.*" I could not even prevail on them to stay to witness its disappearance.

This plain is bounded on the east by a swampy j'hîl of considerable extent. Could the blue vapour which I distinctly saw, be what is generally called *Malaria?* If so, I have certainly seen it, though "in a questionable shape," contrary to the opinions of many who deem it impalpable and invisible; at first I attributed the fears of my servants to superstition, but I have subsequently thought that they have reason to fear it, especially if the appearance was really caused by *Malaria*, which is probable; for a great mortality of the people in the neighbouring villages took place in a few days after I had returned from my journey.

The Mirage representing water I have so often observed, that I thought it too common to notice.

5. *Range of the Barometer and Thermometer at Port Louis in the Mauritius in* 1828, *by* LISLET GEOFFROY, *Cor. Roy. Ac. Sc. of the French Institute, for the 2nd Vol. Roy. As. Soc. Trans.*

Month.	Barometer.				Thermometer.				Hygrometer.		Rain.		Thr.	Wind.
	Max.	Med.	Min.	Var. from mean.	Max.	Med.	Min.	Var. from mean.	Max.	Min.	Inch.	Days.	Days.	
Jan....	29·85	29·75	29·65	—.04	89	82	74	+4	96·	78·0	2·87	14	6	N. N. E.
Feb....	29·74	29·64	29·54	—.15	89	85	81	+7	96·3	78·0	5·00	13	2	N. E.
March, .	29·74	29·34	29·14	—.45	87	84	80	+6	101·0	78·0	13·07	17	3	N. E.
April,...	29·86	29·46	29·16	—.33	83	77	72	—1	95·0	75·1	6.63	6	4	S.E.ESE.
May, ..	30·17	29·87	29·77	+.08	80	76	72	—2	95·0	73·0	0·67	5	1	S. E.
June, ..	29·87	29·86	29·77	+.07	80	75	71	—3	94·0	76·0	0·66	7	0	S. E. S.
July, ...	29·98	28·98	28·98	+.19	77	73	70	—5	94·0	79·0	0·25	6	0	E.
Aug. ...	29·98	29·98	29·88	+.19	77	72	68	—6	95·0	77·3	2·13	11	1	S. E.
Sept. ...	29·97	29·97	29·87	+.18	80	76	73	—2	90·3	78·1	0·27	2	0	S. E.
Oct.....	30·06	29·96	29·96	+.18	82	77	72	—1	97·3	76·0	0·21	6	0	E.
Nov.....	29·95	29·86	29·86	+.07	83	79	75	+1	92·3	76·0	1·29	5	2	variable.
Dec.. .	29·90	29·85	29·85	+.06	86	83	77	+5	92·3	76·0	0·44	12	3	E.
Mean,..		29·793				78.2					33·49	104	22	

In adding this to the number of Meteorological abstracts published in our Journal, we have corrected several obvious mistakes in the decimals of the original.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of December, 1835.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	29,049	29,264	0,785	72,1	7,4	6,0	91	,945	,110	0,835	73,7	9,2	8,7	82	54,0	83,5		n.	N.	NW.	clear.	fine.	fine.
2	,026	,295	,731	71,0	9,0	7,2	86	,906	,098	,803	73,1	11,8	10,9	78	54,3	80,7		n.	n.	nw.	do	clear	do
3	,040	,347	,693	69,1	8,4	8,6	81	,926	,164	,762	71,4	12,4	11,7	71	53,4	79,2		nw.	nw.	nw.	do	cir. cum.	do
4	,087	,394	,693	69,2	8,1	7,6	84	,983	,237	,746	71,0	10,1	9,2	77	49,1	79,5		w.	nw.	n.	do	fine.	cumuli.
5	,122	,436	,686	68,9	6,3	6,6	86	,997	,246	,751	71,1	8,0	7,8	82	52,0	81,8		o.	nw.	nw.	do	clear.	clear.
6	,105				6,6			,990				10,4			53,8	79,2		w.	W.	nw.	do	do	do
7	,076	,366	,710	69,4	5,2	5,0	74	,960	,196	,764	71,4	7,3	6,8	86	54,0	82,8		o.	nw.	nw.	hazy.	do	do
8	,074	,364	,710	69,6	6,9	5,9	88	,960	,168	,792	72,5	8,6	8,4	81	55,0	82,6		w.	nw.	nw.	do	do	do
9	,046	,344	,702	69,4	7,1	6,0	88	,934	,166	,768	72,0	8,2	7,7	83	53,2	81,5		o.	nw.	nw.	clear.	do	do
10	,046	,336	,710	69,8	7,3	6,7	87	,958	,196	,762	71,7	8,0	7,7	84	53,7	83,2		nw.	nw.	nw.	do	do	do
11	,086	,378	,708	69,7	7,0	6,3	89	,960	,196	,764	71,4	7,6	7,2	85	52,8	84,8		n.	n.	nw.	do	do	do
12	,094	,397	,697	69,1	5,1	4,6	93	,956	,198	,756	71,1	7,9	8,1	81	50,3	84,0		o.	n.	n.	do	do	do
13	,062				4,8			,911				10,3			50,2	85,5		o.	n.	n.	fog.	do	do
14	,042	,339	,703	69,3	5,9	4,6	92	,946	,188	,758	71,3	6,3	5,6	89	52,0	83,8		o.	n.	n.	do	haze.	cumuli.
15	,047	,298	,749	70,3	5,6	5,1	92	,938	,147	,791	72,0	7,1	6,6	86	53,4	86,2		o.	ne.	n.	cirri.	clear.	fine.
16	,070	,342	,728	69,7	4,7	4,4	94	,949	,124	,825	73,0	7,6	7,0	86	53,4	84,3		n.	nw.	nw.	clear.	do	clear.
17	,049	,298	,751	70,6	6,2	5,2	91	,944	,147	,797	72,3	7,9	8,0	81	53,7	83,8		o.	n.	nw.	fog.	do	do
18	,056	,334	,722	70,0	5,7	5,1	91	,910	,118	,792	72,7	9,9	9,7	78	54,2	84,8		o.	W.	w.	do	hazy.	do
19	,013	,266	,747	70,7	7,3	7,2	85	,872	,110	,762	71,9	8,3	8,7	79	53,2	86,5		ne.	w.	n.	do	clear.	do
20	,007				7,2			,900				10,4			53,4	83,8		o.	n.	n.	do	do	do
21	,008	,269	,740	70,5	5,5	5,2	92	,898	,096	,802	73,0	8,7	8,4	83	54,8	82,2		o.	W.	w.	do	do	do
22	,999	,247	,752	70,7	5,4	5,2	95	,890	,047	,853	74,2	9,2	8,9	82	54,7	86,8		o.	W.	w.	do	do	do
23	,033	,270	,763	71,5	5,2	5,3	92	,924	,070	,854	74,3	8,7	8,1	85	55,2	85,6		o.	nw.	nw.	do	do	do
24	,958	,196		71,9	4,6	4,0	95	,867	,034	,832	74,0	6,9	7,4	83	55,6	89,1		o.	w.	nw.	do	do	do
25	,954				5,1			,975				11,5			56,7	87,8		o.	o.	n.	clear.	do	do
26	,968	,140	,828	73,0	3,9	4,0	91	,846	,940	,906	75,9	6,6	6,1	89	60,8	83,0		E.	W.	sw.	do	cumuli.	do
27	,005				2,9			,884				9,3			58,8	75,4	0,05	E.	E.	ne.	cloudy.	rain.	cloudy.
28	,019	,396	,623	66,4	6,8	5,7	87	,897	,196	,701	68,9	10,0	9,4	76	49,2	72,2		NW.	nw.	nw.	clear.	clear.	clear.
29	,016	,347	,669	67,6	7,8	8,0	79	,897	,194	,703	69,1	11,2	11,0	70	47,0	79,8		ne.	ne.	nw.	fog.	do	do
30	,977	,328	,649	67,1	6,0	6,2	86	,883	,147	,736	70,1	9,9	9,5	78	47,5	80,7		ne.	e.	e.	clear.	do	do
31	,040	,376	,664	68,1	5,4	5,4	89	,948	,198	,750	70,4	6,6	6,1	88	52,2	83,2		e.	ne.	nw.	do	do	cumuli.
Mean,	30,038	29,312	0,716	69,8	6,1	5,8	88	,927	,143	0,787	72,0	8,9	8,2	82	53,3	82,8	0,05						

Captain HENNING, of the Windsor, has afforded us another opportunity of comparison with the barometer of the Royal Society at Somerset House. This gentleman's marine barometer, compared with ours last year, was found on arrival in London to stand a little lower than before the previous voyage. Col. SYKES' memorandum made it in June last, ·120 lower than the Roy. Soc. standard at 32°. It is now found to be 0,102 below our standard at 32°, making ours—·018 of the R. S. Barom. (See Met. Reg. Nov. 1834.)

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